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AMATEUR TELEVISION MAGAZINE

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MAY-JUNE, 1980

"GOOD IMAGE '80" WINNER WB6BAP ERNIE WILLIAMS

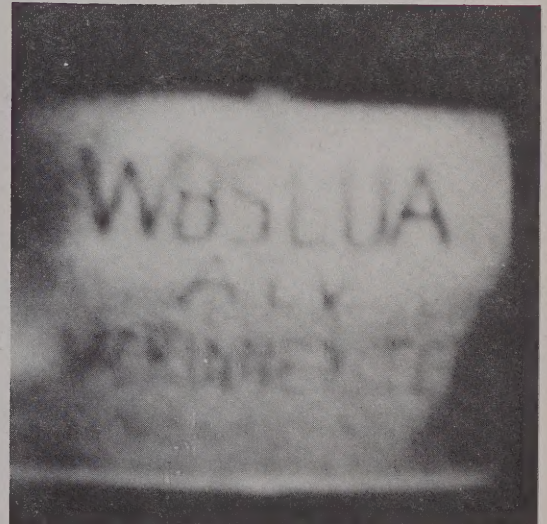
K6AEP-COMPUTER SSTV

¼ WATT ATV, 215 MI DX



microcomputing

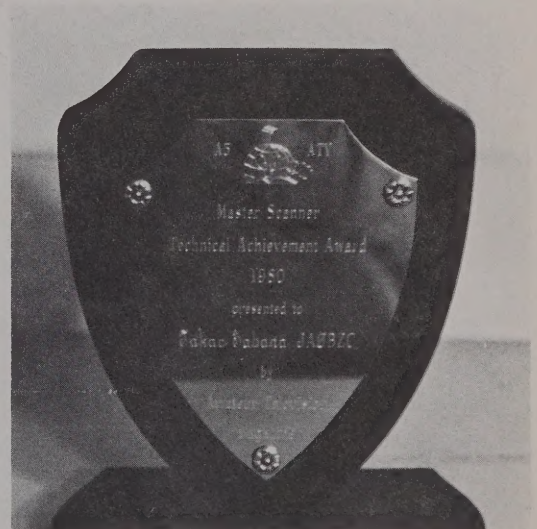
Distance 215 Miles!



First OKLA - TEXAS ATV 2 Way with W5DFU, Tulsa April 3, 1980 at 0625 GMT. WB5LUA, McKinney, Tx. was on 426 MHZ-PWR-280. MW.



1st Air to Air ATV Over Las Vegas



WØLMD, W9NTP and JAØBZC receive new award.

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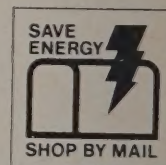
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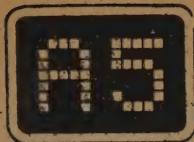
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Tuning Scale for Receiver Frequency, 0 - 5
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Meter, Amp Current or Relative Receiver Frequency

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- 3 Transistor, Varactor UHF Converter with Sensitive RF Stage
- Full RF Gain Control
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- Provision for Optional 2 Stage Low-Noise Pre-Amp





DEVOTED TO HAM TV

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Amateur Television Magazine

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NEWS

AMATEUR TV REPEATER FOR TUCSON -- Several Radio Amateurs in Tucson are in the process of establishing a UHF Amateur television repeater station to serve the Tucson area. It won't be located on a mountain top and thus may not reach Phoenix. The proposed frequencies for crossband operation are 438 MHz. in and 1265 MHz. out. It will feature color picture compatibility and subcarrier sound. 73, BCNU ON TV -- UL C ME. Bill Munsil, N7AOU.

By Bill Munsil, N7AOU

SWL ON ATV? While testing my ATV station at the QTH of KB7FE, he received a call from his next door neighbor. She said she heard Frank's voice on her home TV on channel H! Frank said, "Oh no, not TV! After all this time." She continued and said some guy had a sign saying N7AOU/ATV. Yes you guessed it -- she was tuned to channel 80, (the second harmonic of 434 Mhz).

Frank & I rushed over leaving Frank's boy on the camera and Frank's wife on camera talking both on the phone and the TV and listening to K0JOA on 2 meters who was also present checking his TV converter. We tuned the neighbor's TV down to 434 MHz and got snow free pictures. Frank said, "It's ok if other Hams see me on TV, but I'm not so sure I want my neighbors watching."

AMATEUR RADIO TELEVISION SERVICE (A.R.T.S.) is in full swing and gaining

in membership operators worldwide. ARTS is composed of Amateur "Ham Radio"

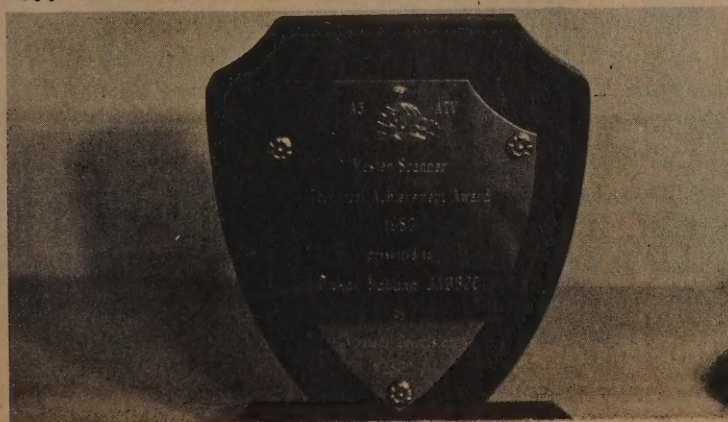
Operators bringing together peoples of the world via Slow-Scan Television.

Founded in the fall of 1979, ARTS operators are relaying the Video-communications to family relatives, friends and loved ones both stateside and overseas via direct station to station relays, taped delayed relays or mailed cassettes. The U.S. Stateside Director of ARTS has reported to A5 Magazine that the use of PHONELINE TELEVISION is being used between operators. For more information, contact "Amateur Radio Television Service", PO Box H, Lowden, Iowa 52255

K1NAA, Jim reports successful contacts during the recent April ARMED FORCES DAY TESTS on Navy-Marine Corps. MARS-SSTV. NAVMARS-SSTV Nets are held on Wednesdays at 2300 GMT on 7.368.5 Mhz. (M4), Saturdays at 2200 GMT on 13.975.5 Mhz. (ME3), Sundays at 1830 GMT on 7.368.5 Mhz. and at 2200 GMT on 13.975.5 Mhz. Interested MARS members should contact K1NAA or their state MARS Director for more details. *Any Army or AIR FORCE SSTV MARS programs?*

OSCAR Phase 3 went up in smoke on May 23rd when a 1429 UTC launch aboard a European Space Agency Ariane Launch from French Guiana. One of four rockets suffered reduced thrust at launch plus 1 minute. The guidance system could no longer compensate for the tendency of tumble spin. At 2 minutes into the launch ground-control began losing telemetry and the Range-Safety Officer destroyed the vehicle and with it Phase 3 and any chance for SSTV Communications via the Amateur Satellite. Back to the drawing

...and...



**MASTER
SCANNER
TECHNICAL
AWARD**

First the good news: VE6PW, Bert Farmer of Calgary received his master Scanner Awards for 25 SSTV contacts on 10 meters and five SSTV contacts on each of FIVE bands.

The Maryland Hamfest will be July 27th at the Howard Co. Fairgrounds 15 miles west of Baltimore just off I-70 at RT 32.

The Cass County hamfest will be July 20th at the 4-H fairgrounds. Go north of Logansport (Indiana) on RT 25 turn right at rd 100, follow QSY signs.

Peoria Superfest 80 will be Sept 20-21 at the Exposition gardens, W. Northmoor Rd., Peoria, IL. Will feature live SSTV and ATV including fly-by weather permitting. Tickets \$2, 5808 N. Andover, Peoria 61615. A5 Staff will be there as well as Don Miller who will demo medium scan TV and color SSTV systems.

Hamfesters hamfest (Chicago) will be August 10th at the Santa Fe Park, 91st and Willow Springs Rd., Willow Springs, IL. \$2 PO Box 42792, Chicago 60642.

Melbourne, FL hamfest will be Sept 6th and 7th. Contact James Townsend, 2504 S. Lewis St. Melbourne, FL 32901. They are looking for someone who can set up SSTV or ATV demos.

RTTY fans C. S. Goodman of 5454 S. Shore Dr. Chicago 60615 has a large assortment of late model TTY equipment for sale.

Volker Wraase had his two memory SSTV system on display at Dayton. The unit is made in Germany and there is news that there will soon be an US distributor for the unit. The unit is very compact and has excellent pictures. V. W. Elektronik Wischhostrasse 1-3, 2300 Keil 14, West Germany.

New ATV repeaters: going UP: Clinton, Iowa, serving Illinois and Iowa area ATVers. Sponsored by WB0QCD, WB0KFB, W0YMW, WD0ADZ, WD0AYT, WB0EZK, WB0YNX, WB0VTR. (All Iowa).

DX RECORD? Warren Weldon has been one super active ATV'er as A5 readers know from past issues. His latest achievement is the first Texas to Oklahoma ATV. The Texas station, located near Dallas, was operating with 280 MW (1/4 watt) and although the picture on the front cover of this issue does not do justice, the pix were as good as P-4 over the 215 mile distance to Tulsa. WB5LUA's QTH is in McKinney, TX. His SSB 450 signal was 50 DB over S9. The signals going back to Texas were P5, snow free. The Tulsa ATV was also received by W5HTZ. LUA uses four F9FT antennas at 85'.

ERNIE WILLIAMS WB6BAP is the proud recipient of the annual GOOD IMAGE AWARD from A5. Ernie and friends were flown to Las Vegas, NV by Tom O'Hara W6ORG where A5 publisher Henry Ruh KB9FO made the presentation at the world famous Caesar's Palace Hotel/casino. A champagne brunch was enjoyed by all after the ceremony which was video taped for replay at Dayton Hamvention and at CA hamventions. Ernie and several other LA hams have often provided public service using ATV including "Operation Santa Clause" and several other public events. After the ground activities were over, the group went to the airfield for a few hours of air to air ATV, shooting video from one plane to another. The Cessna used a Hitachi camera, 3/4 wave permanently mounted antenna and a PC Electronics TC-1 transceiver and Sony color TV. The Piper used a Hitachi color camera, VTR home brew receiver and hand held whip antenna, Sony black and white monitor. Portions were video taped including a "dog fight" for showing later. Some 50 ATV contacts were made on the way back from LVA to DCA (Dallas) on a two day return to Washington DC where FCC staffers were introduced to ATV. A stopover in Tulsa was welcome as was warm hospitality by Warren W5DFU.

We got so much info from the VK fellows, we are holding off until next issue so there is enough room to present it all. Look for a 20-30 page FSTV article in our next issue featuring several build it projects.

Sorry to be a little late with this issue, but you wouldn't believe how busy we have been! A lot of good things have been going on and we will fill you in soon.

73's Henry KB9FO



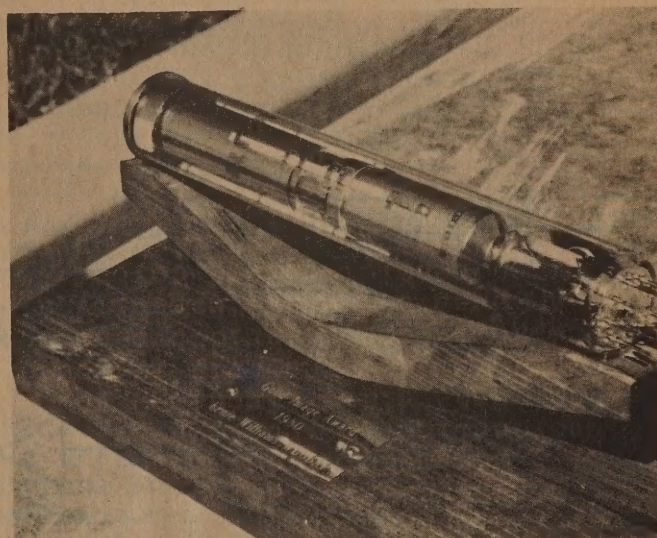
Dayton Award Presentation L-R – Henry KB9FU, Bob WØLMD, Don W9NTP.



Las Vegas, Nevada L-R – Ernie WB6BAP and Henry KB9FO at Ceasars Palace.



A5 Booth Dayton 1980 L-R – Henry, Maryann WB6YSS, Tom W6ORG.



Good Image Award

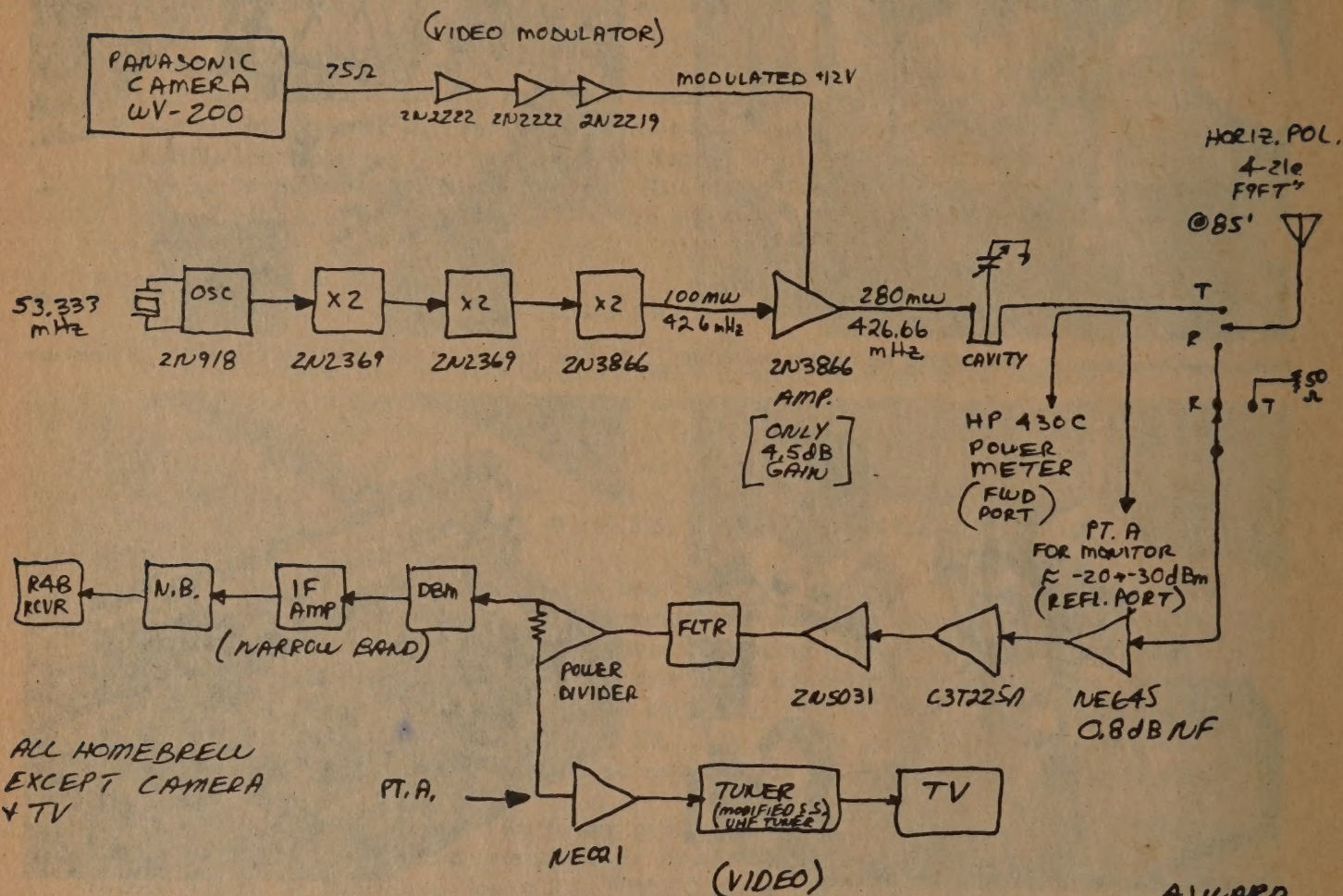


Tulsa, Warren W5DFU and KB9FO



Would you buy a used airplane from this man?...“Only flown on Sundays by a retired Kamakazi Pilot!” Photo by W5DFU

WBSLUA 420 MHz ATV SETUP



AJWARD
2-19-80



Photo by Brad Soule WBØTSG.



Gale B. Sells, Portland, Oregon W7AMQ

MORE NEWS

The Indianapolis, hamfest is July 12th and 13th. at the Marion Co. Fairgrounds. It is also the Indiana ARRL convention. Features include live ATV, color wx radar, 50,000 ft under roof flea market (come rain or shine). Camping and food.

Hitachi has come out with a new small color camera, the GP-4. Its only 4.8 lbs with the electronic view finder and 6:1 zoom lens included. There are 2 versions, the GP-4D with the electronic viewfinder, and the GP-4B with a optical view finder. Prices from P. C. Electronics are \$975 and \$749 respectively. The camera has the new 2/3 inch 3 electrode vidicon for excellent color and 250 line resolution. The 6:1 Canon zoom lens is standard as well as a electret mic on the ~~EXETER~~ GP-4D. The GP-4B has a 3:1 zoom and mic. Both have a adjustable full range color temperature control and automatic light compensation. Its made primarily for video cassette recorders but is great for color ATV.

While they last C.O.M.B. Co. has a limited supply of Video Brain computers for only \$88. See page 185 of the May issue of Popular Science Magazine. We had one in the A5 booth at Dayton and had a ball with it putting in color messages, playing video pinball, and other games. They have a number of game cassettes available at \$12 each. Their toll free number is 800-3285082. There must be a way to integrate it into the local repeater.

P. C. Electronics has put their TVC-1B and extra low noise TVC-1C into a cabinet with its own power supply for those who are not ready to commit to building a station but want to take a look at what is going on. The model number is TVC-4 and is priced at \$85 for the standard unit and \$115 for the extra low noise version with the NE64535 preamp stage.

For those who need a little more gain on receive but dont want the intermod and overload, Advanced Receiver Research has channel amplifiers tuned to any specified TV channel from 2 thru 13 with 8 MHZ bandwidth. The gain is 15 db and is housed in the same box as their P432VD 400 MHZ MRF901 preamp but with F connectors. Price is \$28 ppd from P. C. Electronics. You always do better to get your gain after some selectivity as long as there is one low noise preamp stage ahead. Put a volt meter on the TV video IF agc line and turn the converter on and off. If the AGC voltage changes then you have too much gain and are only amplifying the noise and laying yourself open to overload and intermods. TV set gains can vary as much as 15 db from set to set depending on tolerances of the semiconductors and care in factory alignment. The add gain until the agc just begins to change is a good rule of thumb.

RCA has been dumping their over stock of CC001 color cameras for between \$300 and \$400 to make way for their CC003s and 4s. Check with the RCA distributor nearest you to see if any are left. Webers World Discount in Anaheim CA (714-7768711) as of May 6 still has a batch. Panasonic put their name and case around the same circuit boards and those too have been see around for the same price range. About 2/3 of the atvers in So. Calif. are now on in color thanks to these low cost cameras.

Tom O'Hara, W6ORG, has just been appointed a ARRL Technical Advisor for fast scan ATV. Dave Ingram K4TWJ is the Slow Scan ARRL Technical Advisor. Tom asks that atvers be heard at the League as much as possible which will help increase activity and consideration

in band plannig. This is especially important after the WARC has changed the band usage on 420 to 430 for other than the US and for ~~new~~ what modes will be allowed on the new 902 to 928 MHz band. Tell the ARRL that you want A5 to be allowed on the new band and no change to 420 to 450. Let them know our numbers by sending in off the screen polaroids of DX openings (over 100 mi) to Bill Tynans The World Above 50 MHz column. Drop a note to your SCM letting him know the calls of the ATVers in your area, any public service you may be doing with ATV, and what video and 2 meter coordinating freq you are using...you may find there are a few others within range of your video you didnt know about. Send in some articles and hints and kinks (also to A5). Regardless how you may have felt about the League in the past give it another try as they seem to be very receptive to new and different modes now.

THE SKELETON SLOT ANTENNA from Indiana ATV Club.

The "Slot" antenna in its infancy, was merely a slit made in the metal skin of an aircraft. When fashioned to a resonant length and fed accordingly, the shell of the plane would act as an antenna.

Following the last World War, Bill Sykes G2HCD, felt that such an antenna could be adapted for the amateur bands. It could not exist in the original state for obvious reasons.

No engineering information was available, so endless experiments were performed in the "cut and try" category. Finally the Skeleton Slot emerged as we know it now. It resembled two bent dipoles joined at the ends and fed at a common point in the center. Basically the antenna approaches the ever popular "Lazy H" with its figure 8 polar diagram in each plane.

Feeding at the center point of the "8" produced the first phenomena peculiar to this system. Not showing any unusual gains over a commonplace radiation system, it was immediately evident that constant impedances could be maintained over a wide band of frequencies, 30% of the center frequency not being uncommon. You can immediately see the importance of this side light. This can be explained by saying that for some reason, the dipoles appear to be self adjusting. In effect, they appear to be changing electrically.

It is common knowledge that adding parasitic elements to a standard Yagi tends to lower the center impedance of the radiating element until it is necessary to call on ingenious devices to raise the impedance where it can be handled more easily. These come in the forms of folded dipoles, Gamma Matches, "T" Matches and similar feeds.

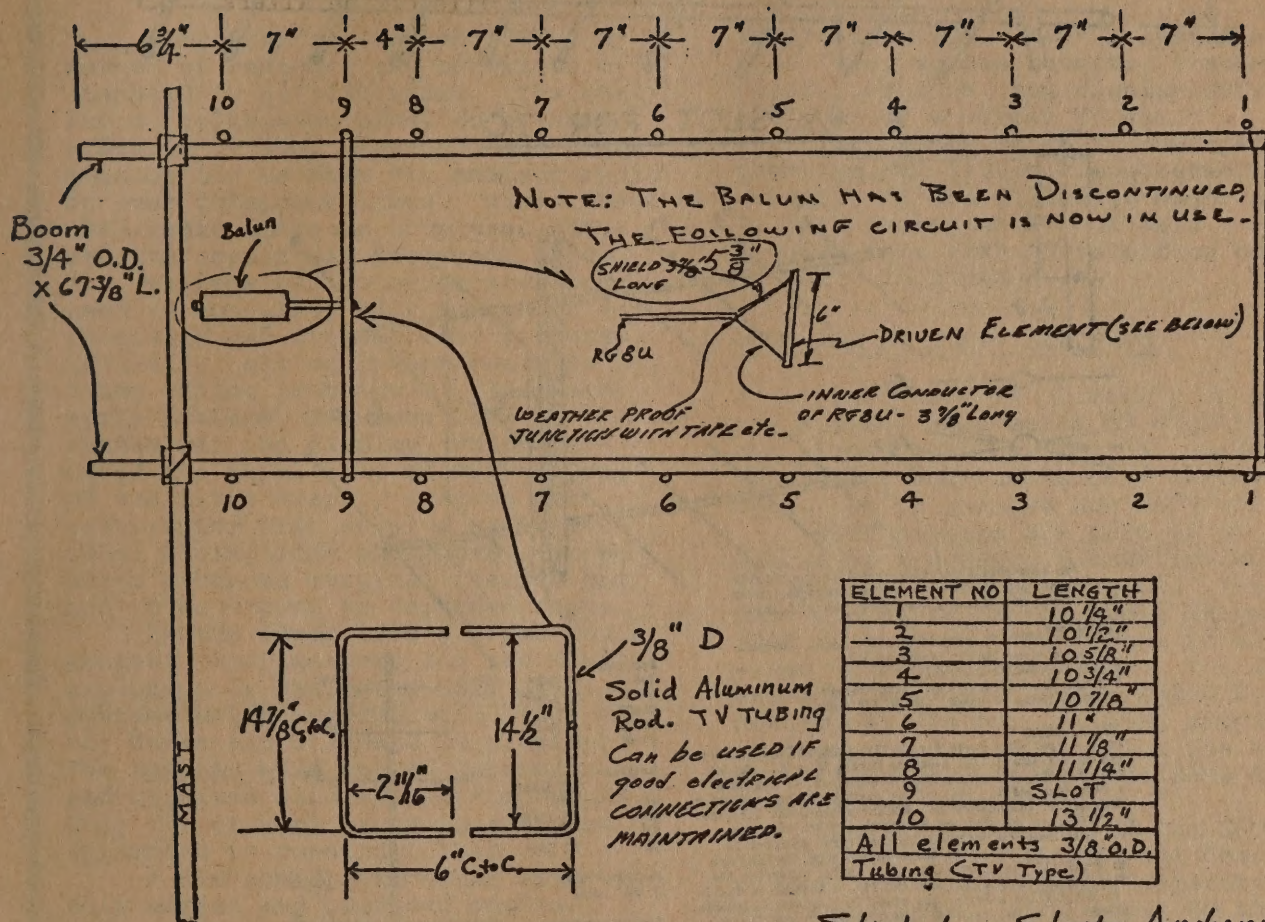
End feeding the driven element, produces a remarkable effect. Briefly put, the center impedance of the driven element changes only very slightly when additional parasitic elements are added. Oddly enough, while the impedance changes very little, the reactance does change to a small degree.

It has already been stated, that the "Slot" has the mysterious effect of combating and nullifying this reactance change. In essence, this means that a "Skeleton Slot" may be set up with an SWR of 1:2 to 1 and after directors and reflectors have been added, it will be found that the SWR is still 1:2 to 1. Making a simple slot antenna into an 8 over 8 has no effect - neither does adding additional units when stacking.

This introduces phenomena number 2. A normally fed Yagi tunes very sharply and bandwidths of more than 3% must result in the compromise of gain. This sharpness makes it very sensitive to nearby objects, rain, ice and snow.

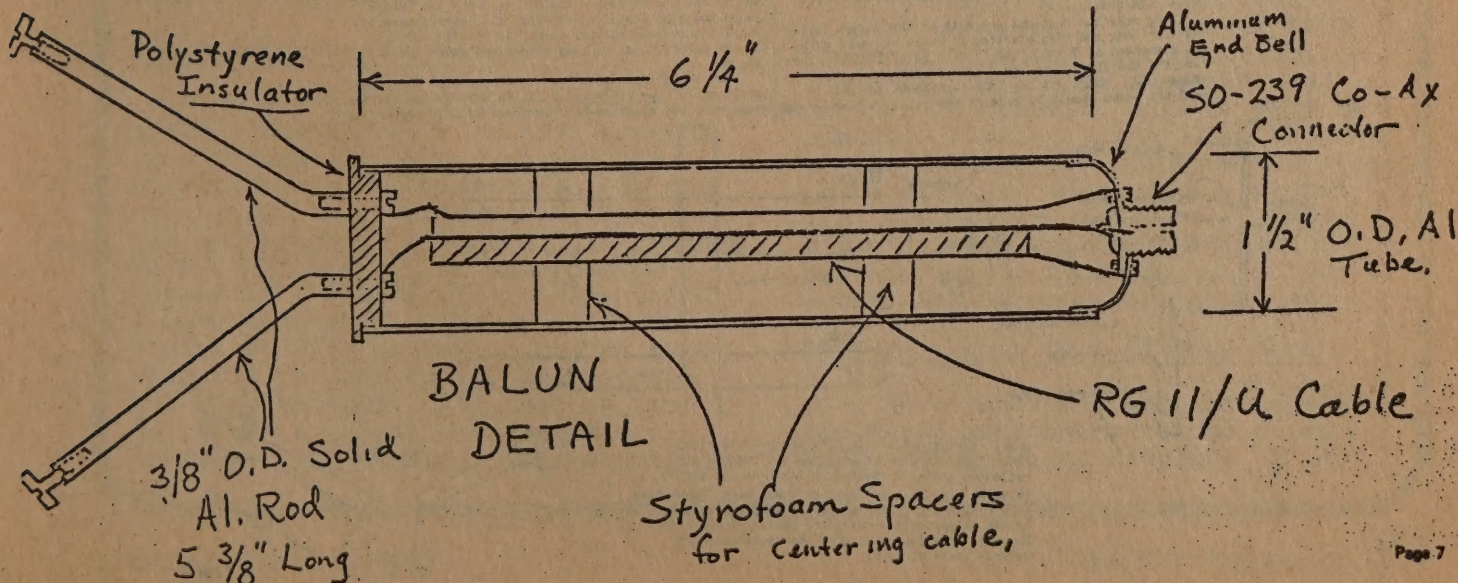
The Skeleton Slot with tremendous broadbanding will easily accomodate a band width of 8% of the center frequency. This will more than cover any band widths in the amateur regions without loss of gains on the edge. In addition, nearness to closeby objects, ice, rain and even indoor conditions will not disturb the properties of the antenna. This is a particular boon to those who must work under devious handicaps.

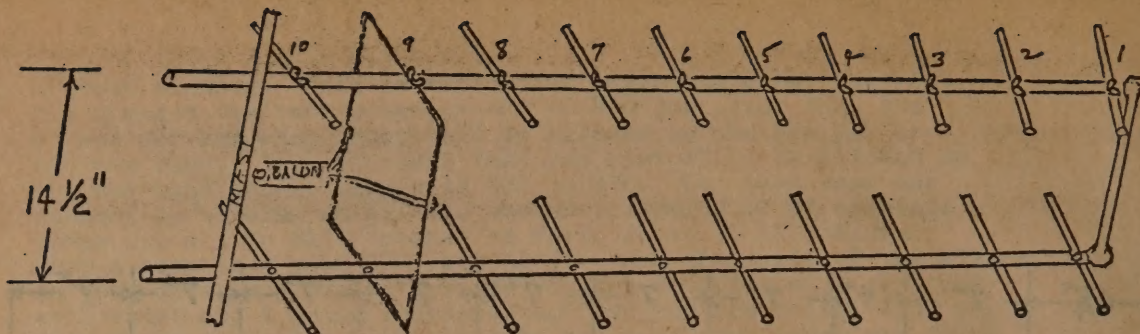
FLASH: The Hoosier Back Yard Hamfest will be Sept 7th. All day, rain or shine, at the Hensonburg School, Vernal Pike at Hwy 37 (4 lane) Bloomington, IN. 78/18 takin.



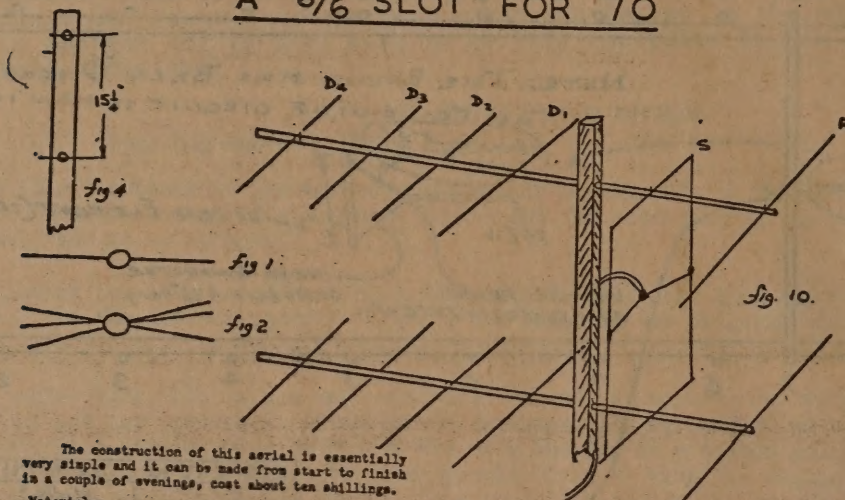
Drawings are not to scale.

Skeleton Slot Antenna for 420-480 MC, 50Ω impedance.





A 6/6 SLOT FOR 70



The construction of this aerial is essentially very simple and it can be made from start to finish in a couple of evenings, cost about ten shillings.

Materials:

- 6 foot of 1/8" all., brass or other metal. (bicycle mudguard stays highly recommended)
- 2 lengths dovell, 1/2" x 2' 6"
- 1 length 1" x 1" deal - not less than 2' 6"
- 4' 6" of brass or copper tubing 1/8" dia.

Construction:

First prepare the booms for drilling. Smooth with sandpaper and draw a pencil line down the dovell; this will act as the drilling reference line. At 2" from one end mark a reference point - this is the position of the reflector. Mark off at the appropriate distances along the line the positions of the slot and directors. Check that the slot from the reflector to the fourth director is 5' 5/16". Now drill the holes in the boom, taking care to drill all the holes at the same angle, otherwise the finished elements will look like fig. 2 instead of fig. 1. Do not drill a hole for the slot. The parastatic elements should now be cut to size. Label each with its length and number, and insert each into its appropriate hole. If they are too tight enlarge the holes with a scrap piece of rod sharpened at the end and held in an electric drill - ensure that the drill goes through straight! Once the booms and elements have been completed the boom support should be drilled - fig. 4 - care should be taken to ensure that they are accurately drilled otherwise the booms may droop. A small screw will hold the booms.

To make the slot cut a length of the copper tubing 41 1/2" long and then starting from one end make marks at distances of 7 1/4", then 5 1/4", then 15 1/2", then 5 1/4", and finally another 7 1/4" to the other end. These marks represent the four corners of the slot, and the bends should be made at the points - bend around

Specifications:

R-S	3 3/4"
S-D1	3 1/16"
D1-D2	7"
D2-D3	6 3/4"
D3-D4	6 3/4"

Lengths:

R	13 5/16"
D1	12"
D2	11 13/16"
D3	11 5/8"
D4	11 3/8"

Matching Bars:

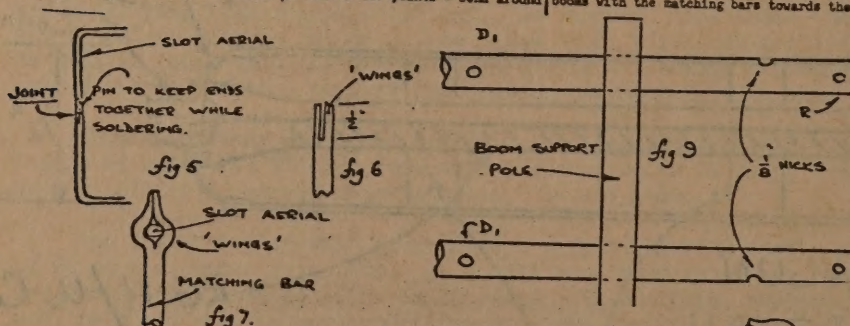
3 3/4" each.

Slot dimensions:

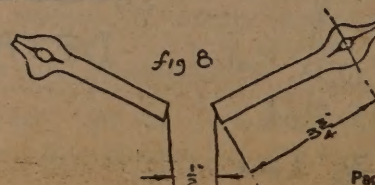
5 1/4" x 15 1/2"

any convenient curved surface. Ensure that the two ends meet and then solder them together - fig. 5. Plenty of heat needed here to prevent dry joints. Cut two pieces of copper tubing 4 1/4" long and cut a slot 1/2" long in one end of each - fig. 6. Bend the two 'wings' around the slot aerial sides - fig. 7, taking care to see that they are half way along the 15 1/2" sides. Once in position cut off any excess and solder as in fig. 8.

Cut a 1/8" deep nick for the slot - fig. 9, then remove one of the reflectors. Slide the slot on to the booms with the matching bars towards the boom support



pole. Bend the slot slightly to ensure a tight fit. Tape the slot in position and replace the reflector element. Solder on the coax, arranging it as in fig. 10. As usual at these high frequencies only really low loss coax should be used, and as little as possible between the aerial and converter. Tape the coax joints and give the whole assembly several coats of paint.



A SLOW SCAN TELEVISION SYSTEM USING A MICROPROCESSOR

Clayton W. Abrams, 1758 Comstock Lane, San Jose, CA 95124
(K6AEP)

Slow Scan Television (SSTV) is a method of reducing the bandwidth of standard TV by 1000 times. The quality of television produced by such a system is low. However, the transmission can be made via amateur radio or over telephone lines. Since about 1967 radio amateurs have used SSTV, and its popularity increases daily.

Various technologies have been used to construct SSTV equipment for receiving and transmitting pictures. Initially, all equipment was made by using analog techniques. In these early systems, one weak link in the system was the display, which reduced the popularity of SSTV. Some of the first display systems were constructed with surplus radar CRT tubes having long phosphors. These units produced marginal results and had to be viewed in darkened rooms.

In the early 1970's a few radio amateur experimenters led the digital explosion by designing SSTV display systems which incorporated large memory banks and standard TV displays. The systems were bulky, expensive, and required hundreds of components. Only the bravest of radio amateurs attempted to construct them.

A few commercial firms entered this market and produced digital units. These units are currently very popular and are in wide use in the radio amateur community. However, they have one big drawback -- they are expensive.

The Microprocessor Revolution

We are currently experiencing another breakthrough in SSTV systems, the integration of microprocessors. Microprocessor technology solves most of the earlier problems and improves the performance of the single-purpose commercial units. In this paper, I summarize a number of articles which I have published. The articles describe an SSTV system which has more versatility than any of the devoted hardware designs. All that is required is a general-purpose microprocessor system and a few low-cost

interface cards. With a system of this type, we can receive, transmit, create, enhance, and display SSTV pictures on a normal TV set.

The system which I developed uses the MC 6800 microprocessor and consists of the following major parts:

1. SSTV analog interface card
2. SSTV fast scan TV interface card
3. Software package

SSTV Analog Interface Card

Since SSTV is primarily an analog system, some means of digitizing the signal must be created. Before discussing how such a card is developed, let us examine how SSTV works.

SSTV signals are part of a scheme of frequency modulation which is applied to an RF carrier. The SSTV signal is in the audio range of 1200 to 2300 Hz. Each tone is either video information or sync. The duration of the sync signal (1200 Hz) determines whether the sync signal is horizontal or vertical. The audio frequencies of 1500 to 2300 Hz control the gray level.

The first portion of the SSTV-to-computer interface is the demodulator. The demodulator separates video and sync. Sync input to the system is TTL pulses and the video is a varying DC level of 0 to 5 volts. To place a digitized picture into the microprocessor system, all that is required is an analog-to-digital converter. To output SSTV pictures from the microprocessor, a digital-to-analog converter is used in conjunction with an SSTV modulator. Figure 1 is a block diagram of the system. For those who desire more detail of the system, schematics, and theory, refer to 73 Magazine.¹ Also, another description appears in the Proceedings of the Second West Coast Computer Faire.

SSTV Fast Scan TV Interface Card

As I mentioned earlier, one of the most important portions of an SSTV system is the display. I re-

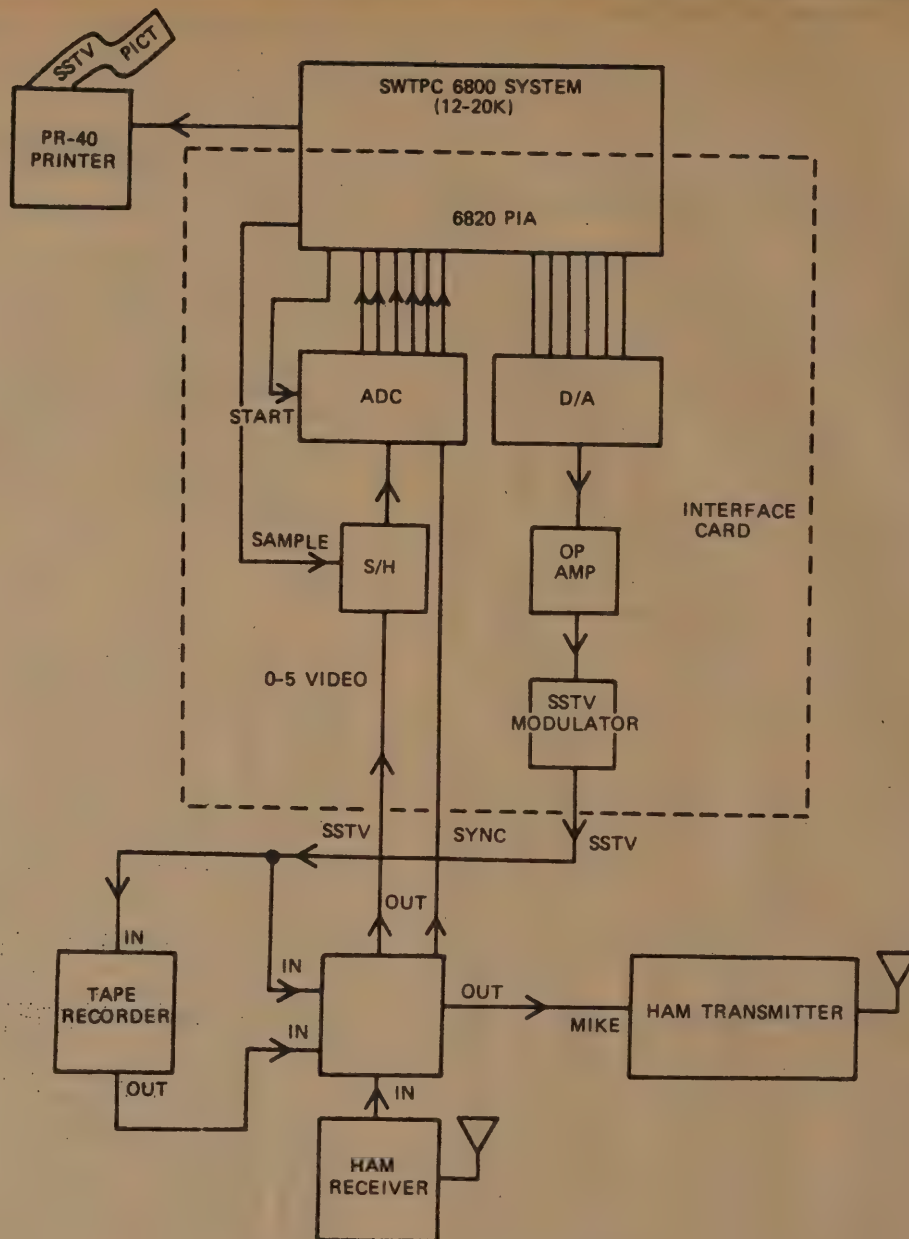


Fig.1 Computer interface

cently developed an interface card for the SS-50 microprocessor buss to display a digitized gray level picture contained in RAM on a standard TV monitor. This card uses a CRT controller chip which was first available in 1978. The CRT controller chips are new devices which greatly reduce the complexity of microprocessor display systems. Approximately four types of controller chips are available from major integrated chip manufacturers. In my design I used the MC 6845. This chip replaces about 40 integrated circuits. It contains 18 registers which can be

programmed to specify various parameters about the video to be displayed. The unique feature of the MC 6845 is its ability to refresh 16 K of RAM. A gray level picture requires the refreshing of large amounts of RAM.

Figure 2 is a flow chart of my scan video card. The card uses 18 IC's and can be fabricated for less than \$100. The card operates by using DMA to refresh RAM at a fast scan rate. The data from RAM is shipped to a digital-to-analog converter and a TV modulator circuit. Since the refreshing is accomplished by the MC 6845, the system is very versatile.



Fig.3 SSTV picture displayed on fast SCAN TV

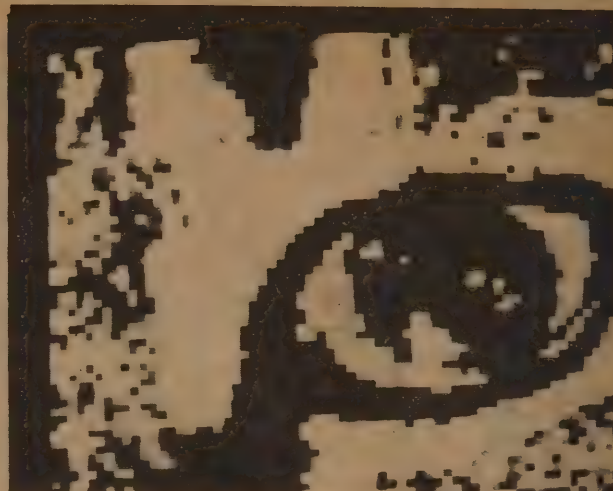


Fig.4 Fast scan TV zoom of SSTV picture

greatly enhance the earlier article.¹ The following is a brief description of these two packages.

1. Receive and transmit an SSTV picture with either 128 or 256 pixels/line with 16 or 64 gray levels.
2. Zoom in on any one of 5 locations on an SSTV picture during transmission.
3. Enhance SSTV pictures received by
 - . adding contrast to a picture in RAM
 - . remove noise by averaging pictures during reception
 - . performing a binary enhancement of a picture during transmission
4. Printing a hard copy SSTV picture on the system printer.
5. Rotate pictures on transmission by either 90 or 180 degrees.
6. Add titling to an SSTV picture in RAM in any portion of the picture in RAM with or without background.

My most recent software package will be published with my article on fast scan interface board. A number of my earlier routines were rewritten to allow for placing the software package on EPROM. Additionally, the package provides two new features

from the earlier software package. These features are

1. Quarter framing of SSTV pictures. Four unique pictures can be received into one composite picture and be transmitted or displayed on fast scan TV.
2. Fast scan TV pictures can be displayed and enhanced by zooming. A total of two pictures can be received into RAM and displayed on a normal TV set with a resolution of 128 pixels/line and 16 gray levels.

Conclusions

The slow scan television system which I have developed demonstrates how microprocessors can be used for amateur radio SSTV. With a small investment all of my work can be easily reproduced. I am sure that, as the use of microprocessors becomes more popular with radio amateurs, others will expand on my work.

Reference

1. SSTV Meets SWTPC, Parts 1 and 2, Clayton W. Abrams (K6AEP), 73 Magazine, November and December 1978.

FMA5 AUDIO SUBCARRIER GEN REVISITED

There have been about 4 revisions to the original design that appeared in the April 1967 issue of 73 Magazine. ATV transmitter hunts were popular here in those days and I wanted a cheap and dirty way to talk back to the mobs. I had a GE Prog in the trunk that was video modulated and by adding the subcarrier gen I could get just enough 4.5 mhz thru to kid the searchers along when ever they got near. I found that the Prog plate Q was too high to let much 4.5 mhz thru but that the RCA CMU15s were fine. The CMU15s were the most popular base ATV rig at the time due to their availability and ease of conversion. (see chapt 2 of ARRL Specialized Communications Techniques) For many, adding the simple circuit to their existing rig was preferable to putting on another fm rig and antenna system due to the relative ease and the fact that they would rather put their hobby dollars into a good camera. Some bought the Motorola T44s for the sound. They would work fine with the deviation pot all the way up and by using a omni antenna, it also served as a second coordinating freq along with 2 meters. Since the output powers of the video xmtr and the sound xmtr were about the same, the difference in the antenna gains made the ratio about right. Broadcast TV rules say that the sound radiated power must be between 7 and 10 db down from the video carrier. Further attenuation is done in the tv set so as not to beat with video components especially with color. Monitoring the limiter current also helped align the beams before turning on the video also.

Today running small solid state rigs seems to be most popular rather than the old hot tube rigs. The only drawback to mixing FM with the video AM (and this is true for fming the video carrier also) is that the sync tip clamp will chop the 4.5 mhz such that there will always be some background buzz in the sound. This will vary with the signal strength and the quality of AM rejection and limiting in the receiving TV set. Also depending on the TV sets IF alignment, the two audio subcarriers above and below the video carrier may fight each other in the sound IF. This condition shows up by having to tune slightly off best picture sharpness to get best sound. The video IF bandpass is usually down 15 to 20 db by means of a trap to prevent any beat in the picture with the color subcarrier. The normal rolloff is about that same amount on the other side. If they both go thru the 4.5 mhz sound IF limiter at the same amplitude but out of phase then they will cancel or distort. By tuning off down the slope, then one will be stronger and come thru normally. To prevent this if your TV shows this problem is to add a opposite sideband filter or trap to the IF input. Usually a series tuned circuit to ground will suffice set to 50.25 mHz consisting of a .47 uh coil and a Arco 403 3-35 pf trimmer cap. Receiving the sound carrier is more a function of the TV set than how its transmitted. There is no difference between seperate xmtr and the mixing method if the lower sideband sound subcarrier can be dropped down at least 10 db below the upper one at the TV sound IF limiter. Thats why some stations report hearing the sound when the picture is P1 or less, and others need at least P4.

Implimenting the sound subcarrier board is relatively easy but if connected improperly will give poor results. The original design for the tube rigs mixed the sound at the video input by direct connection. It was found that if the camera coax was more than a few feet, that the capacity of the cable and the output impedance of the camera greatly attenuated the 4.5 mhz energy. The cure was to isolate the subcarrier gen from the coax with a 4.5 mhz parallel

The present FMA5 uses a dual op amp high gain mic amp so that with the use of a low impedance dynamic mic (such as used with tape recorders) it allows walking around with both hands on the camera for up to 25 feet from the mic. Watch what the wife is saying in the next room, it may be heard on the air, HI! The soft limiter in the second stage will keep your deviation down to the standard 25 KHZ. The frequency response is kept down to the standard communication response of 300 to 3000 hz but may be expanded by the hi fi types by lowering the 1 mf cap in series with the 1K to pin 2 of the op amp to a .1 disc. Try different values between .1 and 1 mf for the desired treble response.

This has been our most popular board over the years, and is probably responsible for going from a magazine article to a full time hobby/business...consider that next time you think about sending in a new circuit or idea to A5.

[illegible]

5N0DOG
JA3EQC
G3WW

Fast Scan TV-SSTV

Amateur Television DX Chasing

THE ULTIMATE CHALLENGE

Mike Stone, WBØQCD



The thrill of working DX on any mode of Amateur Radio lies in the reality of conversing with a fellow shortwave enthusiast in a remote or seldom heard of part of the world. For many, DX'ing is confirmed by simply achieving the exchange of signal reports-no matter at what power level or rudeness to the other operators on frequency. For some (and it sometimes appears the minority) the satisfaction lies not only in making the contact but in the substance of the conversation which brings forth a newfound friendship. If you find yourself in the second category, then ATV-DX is for you!

A good general rule in DX'ing is to listen (watch). The many required hours of careful preparation in FSTV operation for example can be wasted if one does not follow VHF/UHF broadcast propagation patterns and openings of extended groundwave. All the hardline, double-shielded coax in the world cannot help the ATV operator if he isn't aware of band conditions. SSTV DX'ing is best found around the established calling frequencies. Keep in mind, however, that the DX station you are trying for probably has dozens of other ATV stations also calling him in the same moment, most of which you cannot hear, some on voice and some on video. One method to enhance your chances for successful contacts, is to move slightly off frequency with the hope that the DX station will do likewise and pick out your video frames.

Use large letters in SSTV work, the bigger the better! Video-frame reversing from normally white to black backgrounds is also advantageous. The reasons for this better copy on marginal signals is two-fold; 1. As an SSTV frame paints down the monitor, noise factors produce more black pixels in the scanning line than white ones. Therefore, the black transmitted background surrounding the white characters is more likely to be captured correctly by the receiving SSTV station. 2. The black color actually drives the SSB transmitter harder which excites more RF wattage to the antenna which assures the receiving station a bit better copy on reversed or blacken-framed pictures. One final tactic to keep in mind when DX'ing on ATV, when the DX station is faced with two equal video signals-he or she will always go for the pictures with the most creativity.

Now that you have successfully gotten the DX stations attention and reply, you must hold their interest. Homemade framework of your stations equipment and location is always more interesting than the somewhat tedious keyboard graphics. The older but still reliable P-7 tube converters require 2-3 repetitive frames to successfully capture SSTV artwork. Taping or dumping from "memory" replays of the last transmission is always enjoyable. (See A5 Magazine "Lights, Camera, Action" article March/April 80 issue). DX signal reports is always via the RSV method. QSL rate percentage of return is high on ATV DX'ing certainly because of the fellowship understanding of what all it takes to make the contact. I'll always remember the words of ATV-DX'er ZD8KG, Kent on Ascencion Island who told me once that he is always watching the stateside video, but calls only those who display original-homebrew and interesting programs. Truly, pride is the reward for determined ATV-DX'ers in the ultimate challenge...

**WORLD FRIENDSHIP
VIA AMATEUR RADIO**

ZS6BQT

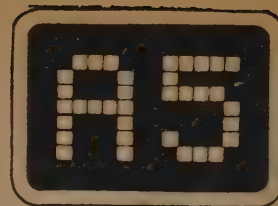
LU4DGN

EA3BCZ

F9KP



SOUTHEASTERN IOWA AMATEUR TELEVISION SOCIETY
S.I.A.T.S.
P.O. BOX 7 LE CLAIRE, IA.



DEVOTED TO HAM TV

ANNOUNCING A NEW "SPECIALIZED AMATEUR-RADIO COMMUNICATIONS"
REPEATER SYSTEM VHF/UHF !!!

Mike Hunt, WØYMW, Chief station-engineer at WZZC-FM in East Moline, Illinois announces the building of a multi-band VHF/UHF Specialized Amateur Radio Two-Way Communications System. Both systems ARRL and State Repeater Council registered.

System location will be atop a 500' broadcast tower located 1 1/2 miles NE of Port Byron, Illinois. The system is broken down into two functions;

1. Fast Scan Television ATV (Black/White & Color) Repeater Relay system

Input on 439.25 Mhz. (A5) Video (regenerative late 1980)

Output 427.25 Mhz. (A5) Video

4.5 Mhz. FM Subcarrier for audio ATV reproduction 429.75 Mhz.

Convertible to modified Channel 3 reception

Commercial-grade transmitter (25 watts) and Video receiver system.

* Receive antenna located at 500 foot level repeater tower.

* Transmitter antenna located around 400' level. Apprx. ASL elevation 1100'.

Closed Repeater System to members only.

Callsign: WØYMW/RPT

Sponsor: Southeastern Iowa Amateur Television (ATV) Society

* Direct beam-path lining Cedar Rapids-Quad-Cities-Streator, Ill.

2. Two-meter VHF COR-FM Repeater

Open access

Closed Repeater System

Input 147.63 Mhz.

Output 147.03 Mhz.

FM-Phone, Autopatch (closed), Rtty (Baudot), Rtty (Ascii), SSTV (A5)

Callsign: WØYMW/RPT

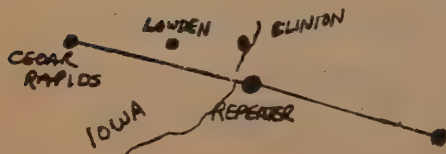
Repeater location: 1 1/2 miles NE of Port Byron, Ill.

Sponsor: WØYMW

Experimentation with WA9LRO 450-link, 448.75/443.75 Gridley, Ill.

All necessary equipment for both VHF/UHF systems have been located or obtained except for the ATV receiver unit. Site and location for antennas is confirmed and low-loss hardline purchased. Expected on-the-air operation late spring-early summer 1980.

Many are building up P.C. Electronics FSTV Converter-Transmitter kits for immediate on-the-air simplex work experimentation. A special meeting "breakfast/brunch" is planned at the "Edgetowner Restaunt", 1 mile north of Brady Street exit I-80 in Davenport for Sunday morning (11 am.) April 20th. Those invited-please plan to attend. Following the meeting, a tour of WZZC-FM Studios and Port Byron antenna location (repeater site) will be conducted by WØYMW.



DO IT ON — VIDEO !

1979 Fiesta Bowl Parade



"Honest, I wasn't speeding"! I was keeping my steady 2-1/2 Mph. Bob, K7ERB, has a final word in typical "crew chief" fashion with Jim, WB7BLF, in the pace car before leading the parade down Central Avenue.



As the parade moved down Central Avenue, ARA members along the route acted as marshals to handle parade problems and to keep it going at the prescribed speed. Included were Bob, W7FEZ (left), and Jay, WB7DQN (right). The parade turned out to be a great success this year with very few problems. This was due to the excellent communications network set up this year by Bob Dreiste and crew. Amateur TV proved to be valuable in spotting parade "gaps" and other problems.



"Boy, This is even better than HBO"! Bill, N7AOU, would rather watch the parade on television than in person. (Amateur TV that is). The parade route can be seen to the right. This place had the only decent reception. The TV transmitter gear can be seen directly behind Bill.

Page 17



Main Communications post atop the Regency House high rise on Central Ave. was manned by Forest, W7IJP, Bob, K7VOR, and Jack, WA7KRV.

ARIZONA REPEATER ASSOCIATION
S "SQUELCH TIME" FEB. 1980

P.C. ELECTRONICS

MAY 80 CATALOG OF PC BOARDS AND MODULES FOR YOUR COMMUNICATIONS SYSTEM

Solid State Fast Scan ATV Modules

The Basic Four Modules

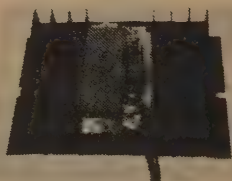


1. TXA5-3 ATV EXCITER/MODULATOR \$85 ppd

This wired and tested module is designed to drive the Motorola MHW-710 module in the PA5 10 watt linear amp. The crystal in the 100 mHz region keeps harmonics out of two meters for talk back. The video modulator is full 8 mHz for computer graphics and color. Requires 13.8 vdc reg @ 70 ma. Tuned with xtal on 439.25, 434.0, or 426.25 mHz.

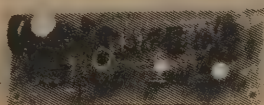
Two Freq version add \$30.

CA-1 video carrier audio/18 mhz osc add \$49



2. PA5 10 WATT ATV POWER MODULE \$79 ppd

The PA5 will put out 10 watts RMS power on the sync tips when driven with 80 mw by the TXA5 exciter. 50 ohms in and out, plus bandwidth for the whole band with good linearity for color and sound. Requires 13.8 vdc regulated @ 3 amps.



3. FMA5 AUDIO SUBCARRIER GENREATOR. . . \$25.00 ppd

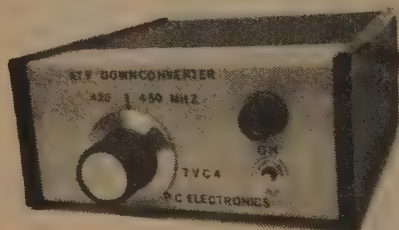
Puts audio on with your camera video just as broadcast TV does at 4.5 mHz. Puts out up to 1 v p-p to drive the TXA5 or VM-2, 3, or 4 modulators. Requires low Z mic (150 to 600 ohms), and +12 to 18 vdc @ 25 ma. Works with any xmtr with 5 mHz video bandwidth.



4. TVC-1B ATV DOWNCONVERTER \$49.50 ppd

Very sensitive MRF901 (1.7 db NF) preamp and double balanced mixer module digs out the weak ones but resists intermods and overload. Connects between uhf antenna and TV set tuned to channel 2 or 3. Tunes 420 to 450 mHz. Requires +12 to 18 vdc @20 ma.

Super sensitive TVC-1C with NE64535 preamp (.9db NF) preamp \$79.50 ppd



NEW!

TVC-4 ATV DOWNCONVERTER \$85.00 ppd

This is a packaged version of the TVC-1B converter with internal power supply. Has BNC input and F output connectors.

Also available with the NE64535 for \$115 ppd

Size: 5 1/4 X 2 1/2 X 7 inches.

♦♦♦♦♦ Package Specials ♦♦♦♦♦

TXA5-3, PA5, FMA5, and TVC-1b basic module package \$225 ppd

OPTIONS: 2 frequency exciter add \$30

NE64535 low noise downconverter add \$30

Packaged TVC-4 downconverter add \$35

Less TVC-1b downconverter subtract \$40

10% discount on 5 or more of one module ordered at one time to one address.



TVC-12 1200 MHz ATV DOWNCONVERTER \$79.00 ppd

Tunes 1215 to 1300 mHz from the shack. Can be mounted at the antenna to save line loss. Outputs on channel 7 or 8. High rejection to 439 mHz on 1241 and 1265 when used with the 1296-LY loop yagi for full duplex ATV or crossband repeater. Requires 12 vdc reg @ 20 ma and 10K pot.

VIDEO MODULATORS

VM-2 TUBE TYPE XMTR MODULATOR\$20 ppd

Grid modulates tetrodes:5894, 6907, 6524, and high power 4X250 and 8930s

VM-3 1WATT TRANSISTOR XMTR MODULATOR \$20 ppd

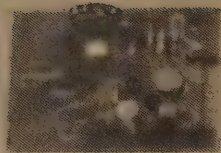
VHF ENG TX432B exciter, etc.

VM-4 2C39 CATHODE MODULATOR\$25 ppd

High level modulate for full color and sound bandwidth on 400 and 1200 mHz.

All PC boards only\$5

2N6424.....\$5 2N3738.....\$5



DM-1 RF/VIDEO DETECTOR & MONITOR\$20 ppd

Connects to antenna coax to sample the xmtr RF. Receiving your own RF can be misleading on a TV due to overload and bounce. Directly drives a monitor with video and with a 50 uA meter gives relative power. Requires +12 to 18 vdc @ 25 ma. PC Board only ..\$5.

TVG-1 ATV TEST GENERATOR \$15 ppd

Connect your camera and you have about one milliwatt on the air for demos or receiver alignment. Just a simple modulated oscillator tuneable from 420 to 450 mHz. Requires 9 VDC @ 7 ma.

CCI-1 TRS-80 TO TV CAMERA INTERFACE\$25 ppd

Superimpose your computer on the camera video for titling or special effects. Board mounts in computer, drives camera and separate monitor. Computer is master sync gen. to externally syncable camera. Hitachi HV-62SU ext sync camera \$325 ppd.

VID-2 VIDEO CALL IDENTIFIER \$99 ppd

Superimposes your call or any combination of 6 letters over the camera video. A must for repeaters. Connects in line between camera and xmtr and has own internal sync separator and drive. Controls for position, in/out, black/white, and two camera video switcher. Requires 12 vdc @ 200 ma. Extra programmed ROM...\$15.

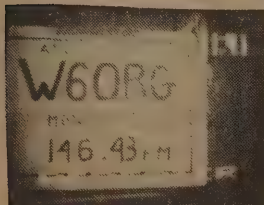
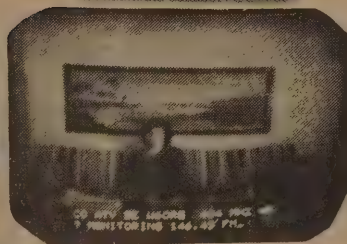
VC-1 VIDEO CLOCK 6 digit 12/24 hr superimposed with VID-2 on the screen. 2 extra digits available for S meter, temp, etc. add \$59.

VA-1 VIDEO BUFFER / INVERTER \$12 ppd

Isolates video line to drive other devices such as monitors xmtrs, VCRs, etc without loading. Make your own video distribution system or convert a TV to a monitor. Specify inverting or non inverting. Requires +12 to 18 VDC @ 25 ma.

TSQ-1 S-METER AND SQUELCH BOARD \$5 ppd

Tap into the TV video IF AGC line, break one speaker lead, connect into this board and you can align the antenna better and not have to listen to the noise between contacts. Uses common Radio Shack parts.



All prices are delivered in USA. All orders are check, money order, Master Charge, or BankAmericard. Allow 3 weeks after receipt of order for delivery. Charge card orders only by phone 5 to 6 PM your time: (213) 447-4565.

73, TOM W6ORG P.C. ELECTRONICS, 2522 PAXSON LANE, ARCADIA, CA 91006

Fast Scan TV-SSTV

video

A5

Amateur Television Magazine

Mike Stone, WBØQCD

P.O. Box H, Lowden, Iowa 52255



SSTV

As reported in the March/April issue, SSTV DX appears to be at its' peak of the sunspot cycle and has demonstrated worldwide, low-power, QRM free A5 contacts on 10 Meters. Reliably, the band opens at sunrise into the Skandinavian countries with Europe coming in about two hours later. Africa and South American DX is in by noon with West coast, Hawaii, in by late afternoon and Australian and New Zealanders looking stateside with the SSTV-DX

SSTV NETS: 14.230 1800GMT 28.680 2000 GMT
zealanders in strong signal strength by early evening. Just because you don't hear any SSTV signals on the band late evenings, don't assume the band is dead. Point the tribander north and call video CQ's and the JA's will answer you in droves! Twenty meter SSTV at 14.230 remains steady but with the usual QRM. W6OBB-Art and WB7EAW-Tom have been at 3.890 Mhz. from 11 pm till ??? with other SSTV'ers welcome! (SSB) PAØBKL-Ben visited ZS6BQT-Ernie in Africa in January while 5NØDOG-Dave is back on-the-air with CW/RTTY/SSB/SSTV at a new QTH. WB3APB Bill in PA. worked ZS6BTD and 4Z4GU in Israel for nearly two hours one Saturday in March. WB1ARZ-Dick in CONN. had a nice video exchange with HB9AHJ March 7th while WA7WOD-Sam in Utah worked DK7BI in Brenerhaven, Germany. Early morning sunrise DX has been paying off for SSTV DXer WA4UUV as he recently snatched SV2CD-Crete, Greece on 28.682 Mhz. Russian "buzzsaw" QRM was present just before the 73 Magazine SSTV Contest (See K4TWJ's column for results) over 50 kcs wide. WBØTTR is promoting DXCC for SSTV thru ARRL Advisory Committee member WA4UG, 1416 Rutland Drive, Virginia Beach, Virginia-23454 (send your support letters). WB8WDJ worked DX with SM5EEP with a RSV of 585 on March 23rd while Richard-G3WW chalked up another one to his 1,000 plus A5 contacts working VE3LU! Newcomer WB9MCF-Ron in Burnside, Illinois is burning up his Model 70 working T12SW-Costa Rica, DF4FX-Germany and VE6AZM-Canada! Iowa SSTV'er Bill in Boone WDØADZ exchanged pictures with F6ENX in Toul, France for over an hour with RSV at 565. In the SSTV-YL department, W6WDL-Bobby has many stateside ATV contacts and shows her talent in cartoon artwork and electric cars. K6AEP-Clay in San Jose continues to amaze us all with his SWTP-6800 system SSTV programs graphics, enhancements, blowups and analysis. TRS-80 owners WA4OAA, WA7WOD, K1DMU, W6VLH, KA6EVK and WB6AHZ have been demonstrating their keyboard graphics on 10 meter SSTV Net. KA6FEJ-Mark is accepting donations for a new tape recorder in exchange for some "live" nude shots! KA6BRT-John keeps blowing fuses on WBØKFB's artwork! W7KFW-Bob is still wondering how he got the nickname "Mr. Excitement"? K9ILA saw rare pictures of G3WW's QTH by helicopter with Richard later working high-school SSTV station WB9LDH in Chicago area. XE1HN and XE1LCH providing "hot" spanish frames at 28.680 Mhz. Yours truly racked up DX #36 on Easter morning with EA8EV in the Canary Islands (Spain) for a rare contact. ZS6BTD worked TR8WR. Like "grass-skirts"? Tune in KH6SB in Hawaii evenings on 10 meters. Send reports!

Fast Scan TV

Fast Scan TV has a new group called "Southeastern Iowa ATV Society" with WØYMN, WBØQCD, WØOJD, WBØKFB, WB9MCF, WDØFQH, WBØZPX, WB9CKS, WA9IRO and WDØAYT as founding fathers. The group will have a repeater on 437.25 Mhz. this summer and are building up PC Electronics kits & J-Beams. W6OBB-Art now running COLOR FSTV. K5ROV reports FSTV doing well in San Angelo, Texas area. Tom-W6ORG and Maryann WB6YSS (PC Electronics) showed their new 2 crystal ATV exciter board at the Dayton Hamvention. The ATV demonstrations and forums were fantastic along with W9NTP's advancement techniques with Medium-Scan TV. VE3CVC reports a personal record working N9AB in Mundeline, Illinois over 440 m. A5 Magazine is devoting space for this DX column, please send us your DX and activity reports for both SSTV and FSTV! 73's!



Amateur Television

KOYO SOLID STATE CCTV CAMERA

MODEL TVC 1100-2S

LIST PRICE \$345.

SAVE \$100.

D.E.C. SPECIAL \$245.



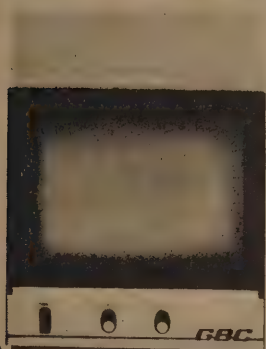
(MODEL) (POWER SOURCE)
TVC-1100-2S 120V AC, 60 Hz

EIA RS-330 INTERNAL 2:1 INTERLACE/EXTERNAL SYNC.

#9368 - Brand new Koyo TVC-1100-2S. Why be satisfied with a limited resolution random scan camera when for very little more, you can benefit from internal 2:1 interlace generator stability or external sync input making it suitable for use with Special Effects Generator. Provides an Internal EIA RS-330 2:1 interlace synchronizing signal generator to assure a clear, sharp picture, compatible with all professional CCTV & VTR Systems. Switch selectable Internal 2:1 interlace or external EIA 2:1 H & V drive for use with a special effects sync gen. Horiz. rez 600 lines. White clipper circuit keeps the signal within standards regardless of scene variation. Auto. Light Comp. 10,000:1. Camera mounting screws on top & bottom of camera. Has high sensitivity 1" vidicon type 7262A, 2 FETs, 30 transistors, 1 IC, 2 Thyristors, 16 diodes. Standard 525 lines, 30 frames, 60 field/sec. With switchable int. or ext. (ext. sync inputs H&V drive signals required are 4V p-p neg polarity). Video bandwidth of 7 MHz provides 1.0V p-p composite, 75 ohm load with 1.0 ft. candle illumination sensitivity with Fl. 8 lens. Power source AC 120V 60 Hz 18W. Only 5 1/2"W 3 3/16H 10 3/4D, 7 lbs. Less lens. Brand new and terrific. Only \$245.00

SOLID STATE OR TV CAMERA WITH LENS 10" MONITOR

\$199.50



#6775 - GBC model MV-10A 10" monitor in 9" case. Rez. approx. 700 lines H w/2% linearity & geometry. Flat to 9MHz w/a reg. low voltage power supply & accepts 0.3V to 2V p-p comp. video for full contrast display. 8 3/4H, 8 3/4W 9 5/8D Wt. 14 1/2 lbs. \$199.50



List Price \$249.95

#5848-GBC model CTC-3000 Video camera-only 5"H 3 1/2W 11 1/2L wt. 5 lbs. Separate mesh vidicon for corner focus. 24, 117 or 220V AC 17VA amps. High sensitivity for use in marginal lighting conditions. ALC 10,000:1. Supplied complete with 16mm Fl. 6 lens. Brand new \$199.50

Brand new flyer 980M2 just off the press listing hundreds & hundreds of bargains in TV cameras, lenses, monitors and associated equipment. Write for free Flyer.

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91st TOURNAMENT of ROSES
ATV COVERAGE in color

Well, here we are again, year TWO for ATV at the Rose Parade. But with one minor difference, we were in living color. Year Two started at the L. A. Fair when my wife and I were in the commercial building looking around and we ran into Fred Edmunds (WB6OJK). Fred is the liaison from the T of R Assoc. to the Amateur Radio group. He asked if I'd consider organizing ATV coverage again for the 91st T of R parade. I don't know if he knew it or not, he was taking his life into his own hands asking me in front of my wife. HI.

The T of R Assoc. asked if we (Southern California ATV Club) could expand to four cameras. Then I added " How about in color?". Fred just about fainted. So here we go!

We had just three months to get the show on the road. The premise had been set, four cameras. And also we needed a second TV receiver set up in the stands for the assistant manager Walter Hoefflin (who'll be manager for the 92nd). So that meant volunteers, thirteen of them in all. To my amazement, I had them all in just a couple of weeks. Thanks guys and lady too.

Here is the list of people who gave it their best shot, and gave a professional performance;

OPERATIONS VAN

Clyde Farris (WA6BAV)
Frank Hasper (WA6JEY)

ASSISTANT MANAGER TV
POSITION

Hank Landsberg (WB6MEU)

CAMERA ONE

Ernie Williams (WB6BAP)
Phil Smith (WB6LQP)

CAMERA TWO

Tom O'Hara (W6ORG)
Maryann O'Hara (WB6YSS)
and kids

CAMERA THREE

ED Knowlton (KB6OW)
Doug Blum (WB6CMW)
Ed Beluso (N6BCK)

CAMERA FOUR

Kinney Smith (WA6YJM)
Doug Brutsche (KA6AGE)

ATV REPEATER SITE

Doug Moon (K6KMN)
Mike Collis (WA6SVT)

This became quite an impressive list when I first made it out and still is. Thanks again everyone, we made ATV work out of the shack.

It now became apparent that there was going to be quite a list of gear involved so a philosophy had to be made. Everyone supplies his own. Each group was made responsible for their position. It worked very well.

The next problem was the extra two positions to be needed this year, extra to last years positions which were already solidified. Fred and I, for three weeks, drove up and down Colorado Blvd. trying to locate a suitable site for cameras 2&3. We'd find a building, Fred would get in touch with the building manager, let me know if or if not it was available, I would go during lunch hour from work to look it over, and then either nail or say to Fred " Let's go for a drive again". HI... We ended up at the LLOYDS BANK BUILDING for cam 3, but for cam 2 we had a little problem with some paper work. We had made arrangements for the SECURITY BANK but at the last moment, Tom and wife were not allowed in. There were some mix ups in the paper mill. At the time, the T of R officials put their heads together and in a matter of minutes had an alternate position located. Tom was now cam 2.

Now, you are probably asking yourself " Why all the fuss with the ATV bit? ". For 6 years now, several FM groups have been 85 or so strong providing much needed special communications for the organizing and operation of the ROSE PARADE. Communications, all channeled into the OPERATIONS VAN. This is where

all information is compiled for the parade, the arrival of the entrees, the towing service, the American Red Cross and the timing of the entrees departures in the parade. During the parade, mechanical breakdowns of the sophisticated floats are always happening, such as the one that didn't make the tight turn from Orange Grove Ave. to Colorado Blvd. tight enough and started for some spectators sitting there. Or the float that was on fire or lost a wheel and toppled over. There is the horse rider who fell off her horse but got immediately back on. Anything goes as far as a parade goes, especially when Murphy is loose. All this info is vital to the parade co-ordinator. The FM ladies and gentlemen have their hands full from 6 PM the evening before to about 2 PM of the parade. The ATV just gave the added extra of vision to the officials. Cam 3's seventh floor perch gave needed info on the gaps that were occurring. Cam 1 saw the start and the first turn. Cam 2 saw the up grade and the bumpy rail way tracks. Cam 4 saw the second turn. Of course all saw the breakdowns and gaps.

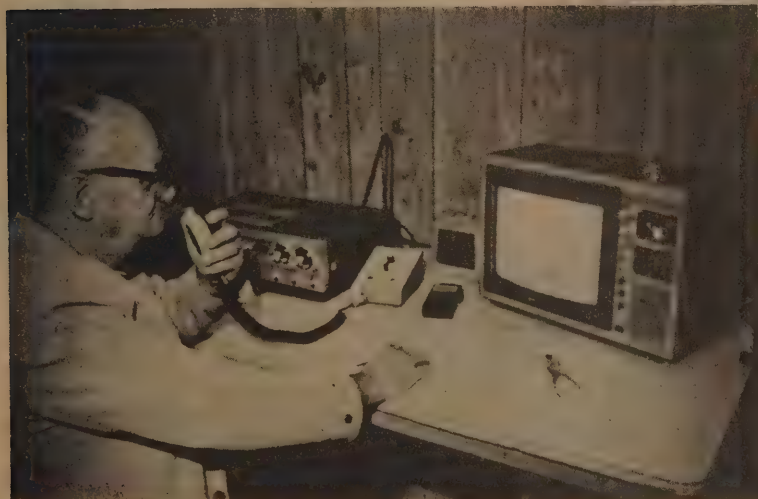
This whole thing started more as an experiment but ended up as a very much needed aspect of amateur radio coverage. It is quite an experience to cart all of your gear out of the shack. Try it some time for something other than field day with your club, especially with something as new, in use, as ATV. It does, when it is over, really give you a sense of accomplishment to put your hobby to work in public service. It is what amateur radio is about. Amateur Television is old in the shack but I think it is new in the field, it's uses are just numerous as your imagination will let it be. With the coming of home color cameras for a price of less than 400 dollars and 12 volt ATV transmitters it is easy now. So now let us get busy and see what we can do next.

See You on A5

A-5

73's

Ernie WB6BAP



*UPPER LEFT
OPERATIONS VAN ANT. SYSTEM

*LEFT
CLYDE (WA6BAV) OP. VAN NET CONTROL

*TOP
ME, ON CAMERA 1, and PHIL (WB6LQP)
ON HANDY TALKIE

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16-Element KLM-144-148-16 \$72⁹⁵

Gain: 14.8 dBd. Beam width at 3 dB pt.: 16 degrees. Feed impedance: 50 ohm balanced (KLM 1:1 Balun, 144-148-50 optional). Boom dia.: 1 1/2". Boom length: 20.66'. Max. mast size: 1 1/2". Center mounting. Wt.: 10 lbs.

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6-Element KLM-420-470-6 \$19⁹⁵

Frequency: 420-470 MHz. Gain: 8 dBd min. F/B ratio: 20 dB min. Beam width at 3 dB pt.: 30°. Feed impedance: 50 ohm balanced (Balun 420-470-50 optional). Boom dia.: 1". Boom length: 2'. Mounting: End or center; horizontal or vertical. Weight: 1.2 lbs.

14-Element KLM-420-470-14 \$31⁹⁵

End mountable; vertical or horizontal polarization. Excellent for repeater control. Frequency: 420-470 MHz. Gain: 13.7 dBi. Beam width at 3 dB pt.: 24°. F/B ratio: 20 dB min. Feed impedance: 50 ohm balanced. Boom dia.: 1". Boom length: 4.75'. Wt.: 4 lbs.

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SOUTHERN CALIFORNIA AREA ATV REPEATER WA6SVT/RPT

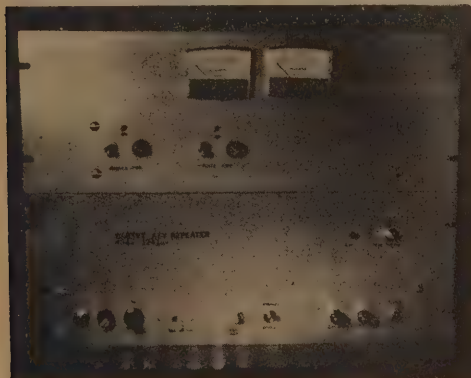
Article by Mike Collis WA6SVT

The repeater is sponsored by Mike Collis WA6SVT and Clyde Farris WA6BAV. Input is 434 MHz and output is 1241.25 MHz with 70 watts E.R.P. This project started in late 1978 many short comings occurred so it was shelved. Then in May 1979 with the help of Clyde WA6BAV the repeater project resumed and completed in December 1979.

The repeater will key up with a P-1 picture on 434 MHz. A 15.75 KHz sync decoder is used to keep other modes from accessing the machine. The receiver features a 2 pole filter with lower sideband suppression and a MRF-901 low noise preamp. The transmitter is all solid state with 4 watts output, This drives a 2C39A linear amplifier (known in this area as the Brass Cat) to 35 watts on sync. Lower sideband suppression is used on the transmitter. Identification is given at first access and every 5 minutes, both audio and video. The antenna system for REC; is a bay of 4 dipoles set for a cardioid pattern with 7 dbd gain vertically polarized. TRANS; is a coaxial colinear set for a cardioid pattern with 7 dbd gain vertically polarized. Antenna height is 90 and 60 feet respectively, if you wonder how it gets out with low antenna height. It is located on a 150 foot TV Broadcast tower on 5900 foot Mt. Wilson where the majority of the TV and FM stations are located for the Los Angeles and surrounding areas.

The repeater was used for the 1980 Tournament of Roses Parade (see the 1980 Rose Parade a sister article in this issue of A5). Coverage was in full color from the four stations at the parade. Later that day Lee WA6ZMI and others in the area used the repeater P-5 some had color. Diane WA6MVD in Sunnymead 65 miles to the east had a P-4 report. When Art W6OBB in Chula Vista near San Diego 110 air miles to the south had a P-3 1/2 report. Dennis WA6PKX in La Jolla 95 miles south had a strong P-4 picture. By this time the DX frenzy hit as a dozen stations tried to work the San Diego stations at the same time what a mess. A 2 meter receiver will be installed to aid in coordination as many ATVers are out of range of the 146.43 MHz coordination channel.

The repeater site paper work is under way so Mt. Wilson can be used as a permanent site. Mike WA6SVT and Clyde WA6BAV wish to thank the following hams for their help. Diane WA6MVD and husband Dick for the donation of the Brass Cat Linear for 1241 MHz. Hugh W6YBI for the donation of the 100 feet of Heliac cable. Doug K6KMN for the use of the site. Earnie WB6BAP for the use of a NTSC video generator and other test gear for alignment of repeater. Any inquiries on the repeater, send a S.A.S.E to Clyde Farris P.O. Box 1591 Downey Ca. 90240.

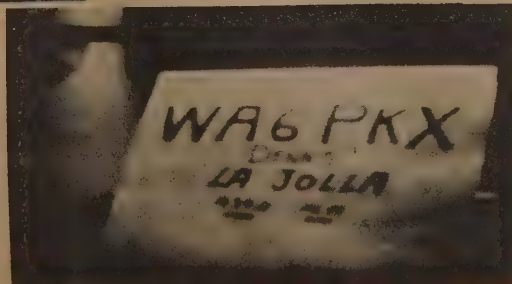


CROSS BAND
REPEATER

ANT. TOWER



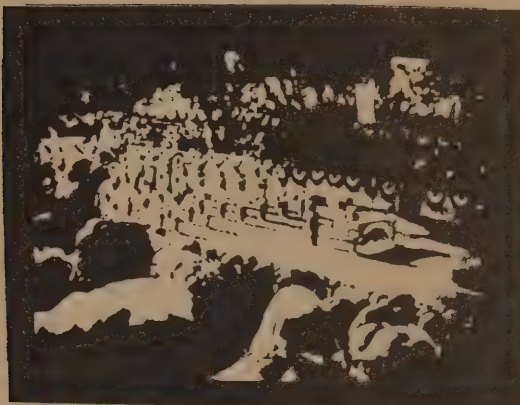
PICTURE FROM
SAN DIEGO





LEFT
CAM 2, TOM & MARYANN
W6ORG WB6YSS

RIGHT
AMBULANCE PICKING UP
A DOWNED SPECTATOR
-OFF THE AIR-



LEFT
BAND TAKING THE LEAD OF THE PARADE
-OFF THE AIR-

RIGHT
FLOAT IN TOW
-OFF THE AIR-



LEFT
THAT FIRST TIGHT-TURN
ORANGE GROVE TO COLORADO
-OFF THE AIR-

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CQ SSTV DE K4TWJ DAVE INGRAM

Contributing Editor
Amateur Television Magazine

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FIRST STEPS IN SSTV

Summertime, the season of hamfests and conventions, is once again upon us. If you haven't yet become involved with SSTV, the flurry of swap circle bargains and SSTV-orientated forums during these pleasant months stand a jolly good chance of altering that situation. If you are presently active in Slow Scan TV, there's a high probability your services in exposing others to our video world (an SSTV forum or discussion) would probably be well received by local gatherings of hamfests. You need not be a professional speaker or electronics engineer for this function: a mere SSTV enthusiasm and willingness to share whatever Slow Scan knowledge you've acquired is quite sufficient. Realizing these two facts, let's begin this month's column with some basic information active SSTVers often take for granted (remember your first days in video communications and your quest for knowledge?).

While being situated slightly "down scale" from state-of-the-art SSTV equipment, P7 type gear is beginning to hit flea market tables at (often) bargain prices. These units are capable of receiving the same SSTV pictures as digital scan converters or microprocessor-based SSTV systems; the prime difference being P7 displayed pictures fade on the radar type screen whereas scan converted pictures can be displayed continuously. Some of the better SSTV "front ends", which offer exceptional noise immunity and DX SSTV receiving ability, are still available in P7 units, (The W0LMD and the W6MXV for example) but most "modern" SSTV systems use less effective "front ends". Yes, SSTV DXers still use P7 gear and dimly lit rooms when searching the bands for new-area contacts. The new SSTVer can also benefit substantially by using his monitor to watch how others operate SSTV, and by checking with the Thursday evening and Saturday noon 14,230 kHz SSTV net. If the SSTV newcomer also acquires a camera, he should remember to set it up without readjusting his monitor for proper picture display. You old timers may remember how you accidentally set up your SSTV gear with shack-only pictures because the camera didn't swing from 1500 to 2300 Hz. Finally, SSTV newcomers or "SSTV curious amateurs" might benefit by reviewing the oscilloscope viewing adapter (A.R.R.L. Advanced Communications Technique book) and checking old 'scope prices at hamfests. We've spotted several good 'scopes for less than 25 dollars, and several times that same "horse trader" was willing to throw in a P7 C R T for the scope. Innovative, but financially burdened, amateurs might also find those "hamfest special" storage tubes beneficial for first-SSTV projects.

If you're considering presenting a program on SSTV for a local hamfest or amateur radio club, consider yourself one of our vitally needed and appreciated "field ambassadors". Remember - new blood keeps our mode alive and growing. We at A5 also want to recognize your activities, so drop us a few notes and maybe some photos of the event. O.K.? I personally try to advance preview the general group to which I will be talking. This will dictate whether the program will be aimed toward "simple exposure" formatting with highlights on activities and basic details such as those shown in Figure 1, or a more advanced form of discussion. This concept is expandable, and can delve as technically deep as the group desires. An example of this "expansion" is shown in Figure 2. With a little planning, the sketched information and technical outline can also be formed into a handout sheet. The group members usually find that tangible information highly inspiring - and it becomes

a formidable reminder to at least give SSTV a good ole college try. If you want to do something beneficial for SSTV and give yourself a feeling of well being at the same time, make a point of exposing non Slow Scanners to our world of visual communications this hamfest season. The rewards are too numerous to describe!

SSTV AND THE 565 PLL

Continuing this month's column with simplicity ideas applicable to SSTV, I would like to share with you some thoughts on the 565 P.L.L. chip. I recently rigged a circuit using one of these I.C.'s for RTTY demodulation, and the results were nothing less than outstanding. The 565 is completely tunable in frequency response/discrimination, and it can follow a weak input to almost noise level. As a bit of curiosity, I measured output voltage from the 565 while swinging an input signal off the chip/circuit's set main frequency. The results were a varying voltage level, which when roughly compared to the SSTV gray scale range of 1500 to 2300 Hz, produced at least 3 or 4 shades of gray. Considering the Apple computer-displayed SSTV, which has only 3 shades of gray, the 565's capabilities as a simple and inexpensive SSTV video demodulator, sync stripper, etc. thus becomes very appealing. One item we whipped together during these experiments was the SSTV sync tuning indicator shown in Figure 3. It is helpful on the home setup, and since it is self-contained, it can also be used while taping Slow Scan on an unfamiliar receiver, while visiting other amateurs, or while operating portable. If you're looking for a simple but effective SSTV tuning indicator, this one's a gem. Set the 565's free running frequency somewhere near SSTV frequencies by monitoring pin 6 or 7 with a small speaker or earphones. Next, connect the L.E.D. and vary R5's value until the L.E.D. is extinguished. Finally, "tweak tune" the circuit into proper operation by feeding a 1200 Hz tone to the input and adjusting both R5 and R6 for L.E.D. illumination only when the injected signal is exactly 1200 Hz. The tolerance of this 1200 Hz can be varied with R6, while R5 determines the exact center frequency.

VK9RH GETS LONG AWAITED SSTV GEAR

Remember the 1979 drive for SSTV gear which resulted in the Robot 400 setup now used by Tom Christian, VR6TC? As you'll recall, this massive effort also resulted in a like new Robot 70 and 80 camera/monitor setup which was to be placed into deserving DX hands as soon as possible. Ray Howard, VK9RH, was then scheduled to receive the Robot gear when transportation techniques could be arranged. We're now pleased to report those efforts have succeeded and Ray is rolling with Slow Scan TV. The story behind this SSTV gear's travels is quite fascinating (at this time, the donor asks to remain anonymous, and we're still respecting that request). Bob Killian, W6PG, recently flew from California to Sydney, Australia; Bob carried the SSTV camera as hand baggage, and then sent it from Sydney to Norfolk via air freight. Fred Stanley, WB7QHV, "hand bagged" the Robot monitor from Los Angeles to Auckland, New Zealand. Barry Walker, ZL1BQM, a professional airplane pilot, then carried the monitor on to Norfolk during an early March flight. Thus through a "roundabout technique" and gear traveling different paths, VK9RH is finally rolling with SSTV. Welcome aboard, Ray!

That concludes this month's column. Thanks to all for your inputs and ideas. We'll be listening for more of your words on 14,230 kHz, and in the old mail box. 73's, Dave Ingram, K4TWJ, Eastwood Village #1201 South, Rt. 11, Box 499, Birmingham, Alabama 35210.

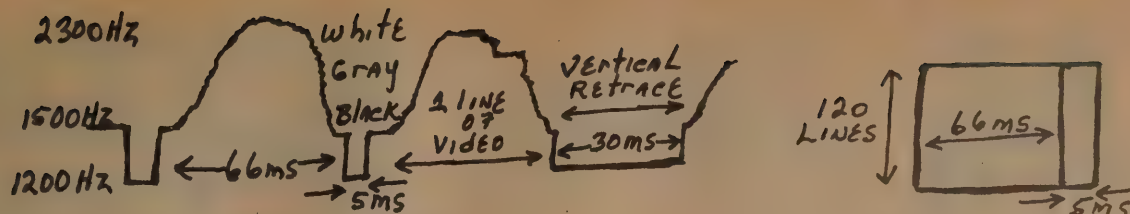


Figure 1 BASIC PARAMETERS OF SSTV, ILLUSTRATING SCANNING LINES AND AUDIO FREQUENCIES ARE A GOOD WAY TO BEGIN "BASIC INFORMATION SSTV FORUMS". THESE PARAMETERS CAN BE DIRECTLY RELATED TO AN SSTV MONITOR AS IT DISPLAYS PICTURES DURING THE DISCUSSION.

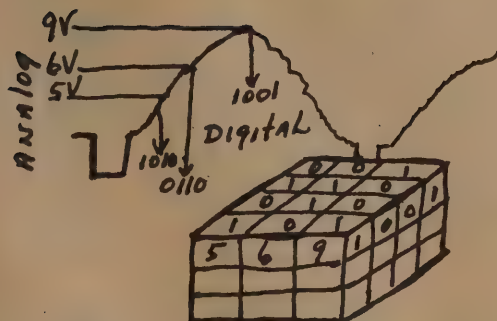
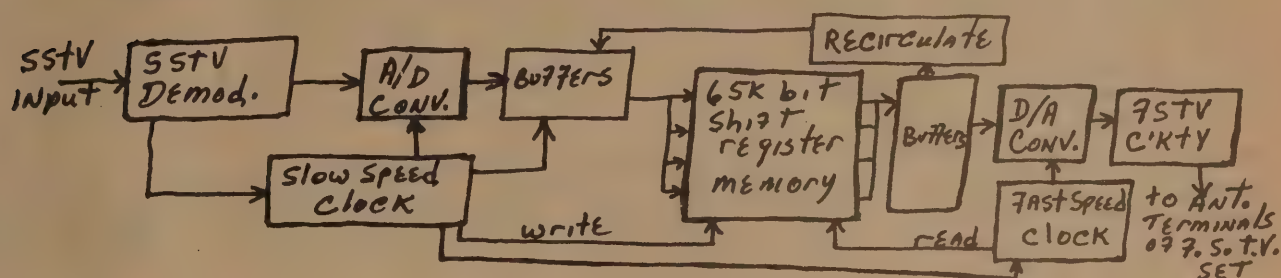


Figure 2 ONE EXAMPLE OF AN EXPANDABLE SSTV DISCUSSION IS THIS BLOCK DIAGRAM OF A DIGITAL SCAN CONVERTER AND A 3 DIMENSION MEMORY. IF THIS INFORMATION IS PLACED ON A BOARD OR OVERHEAD PROJECTOR, THE SPEAKER CAN DISCUSS INTRICATE OPERATIONS FOR 20 OR 30 MINUTES WITH MINIMUM DIFFICULTY.

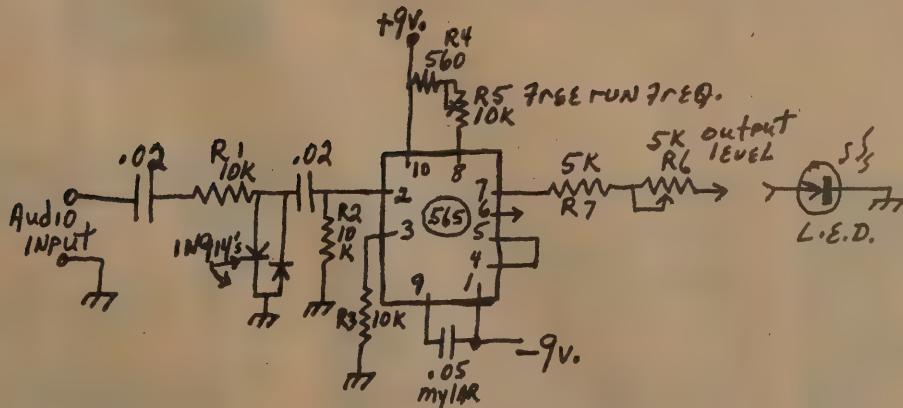


Figure 3 SSTV TUNING INDICATOR USING 565 PLL CHIP AS DESCRIBED IN TEXT.



SSTV video

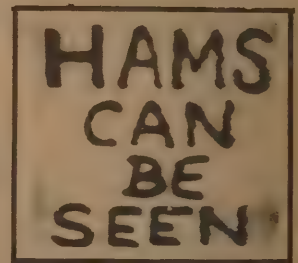
Mike Stone, WBØQCD
P.O. Box H, Lowden, Iowa 52255



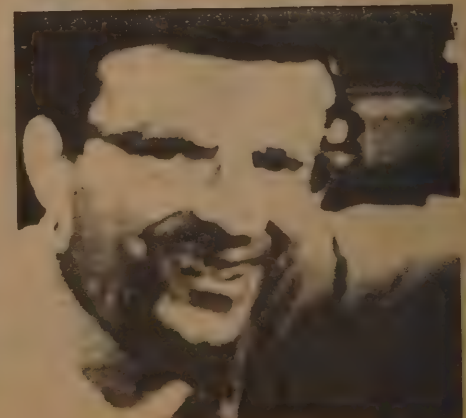
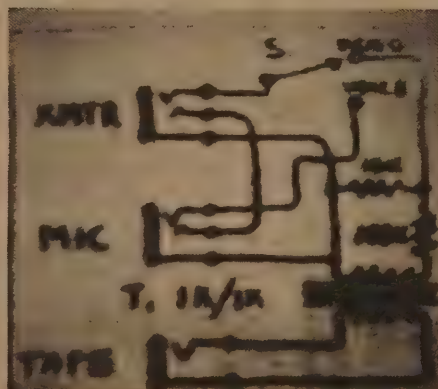
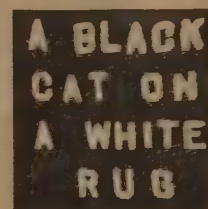
"LET'S DON'T FORGET THE BASICS!"

I don't mean in any way to degrade those SSTV operators with computers and keyboards, (much to the contrary-I intend on owning one someday myself) but I think with all the recent upsurge in activity using keyboard "graphics", we may have gotten a bit off-the track in regards to just what SSTV is all about?

If we wanted to see perfectly formed, easy to read, lettered communications, then we would have stayed in RTTY. More and more SSTV stations are coming on the air with instant keyboards and not even set up in the video-shack with studio operations for artwork. Let's don't forget the basics. Hand-drawn artwork, lettering & cartoons are top on the list of the viewers enjoyment. Stick-on letters obtained at the local arts and crafts store or menu-boards or drawing easels work quite well and get the "natural" message to the receiving operator with much more personality. Black magic-markers and crayons are alot cheaper than plastic buttons. Some of the most enjoyable SSTV video-art that I have seen have come from operators like WB5UDU, KA6FEJ, KA6BRT, W6WDL, K1DMU, WBØKFB, WB9MCF and others who take literally hours of enjoyment preparing their SSTV programs for on-the-air showing.



Once again, let me restate that I have no quarrel with graphic generated keyboards, they certainly have their place and as K6AEP has demonstrated, the graphics can in themselves be turned into artwork. I just feel that more emphasis needs to be directed toward the personalization of "creativity" in SSTV programs.



SSTV *video*

SATURDAY 10 METER SSTV PIX NET

MONTH	YEAR	NET	TIME	FREQ	MODE	NET COORD	NET CONTROL	Qrt
3	80	SSTV	1800	28.680	A3-A5	W7KWP	WBØQCD	2100 Z

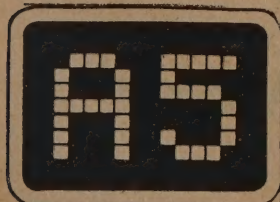
The new 10 Meter A5 SSTV NET on 28.680 Mhz. is declared a success! Starting on Feb. 2nd, NET founders WBØQCD, KA6FEJ, WBØUNB, WB3APB, KA6EVK and WBØKFB saw 23 checkins from 15 states including Hawaii. February 9th's NET brought 31 SSTV checkins including Canada and South Africa. February 16th NET saw 26 checkins including KP4EDK in Puerto Rico. February 23rd was a short NET conducted by WA4OAA with 14 SSTV stations checking in and running VIDEO and with "spring in the air" the March 1st NET brought 40 checkins. The 10 Meter SSTV VIDEO NET continued in March and April with an average NET membership of 32 stations. Not bad considering a similar SSTV NET is also being conducted on 14.230 Mhz.

The "VIDEO" net is unique in that NET CONTROL and his assistants are located in various parts of the United States so that when propagation prevents some from hearing or seeing the others transmissions, the information and video is always relayed as an INSTANT RELAY thereby allowing SSTV operators to see all stations, some of which they have always heard about but never actually seen the video-pictures. The SSTV NET is structured in the following manner;

- 1800 . 5 minute SSTV video NET callup CQ
- 1805 . Net Control establishment and checkins
- 1815 . Net Relay Stations report checkins
- 1830 . Net announcements (bulletins, contests, A5 information)
- 1840 . Net Relay Stations relay Net Controls bulletins (live on tape)
- 1850 . Net roster callup and general comments to the Net
- 1945 . Late station checkins and comments
- 2000 . Closing of SSB portion of Net
- 2000 . Video relaying of remaining Net stations
- 2100 . Approximate close of NET

Understandably, the Net schedule varies with each net. This type of procedure seems to work best as it allows stations who do not wish to run video to obtain all the Net information and contacts comments without having to remain for three hours on frequency. Those who wish to send video, can checkin late and partake of the picture exchanges. If it establishes one thing at all, it certainly lets the SSB 10 meter crowd know what SSTV operation is all about!

Stations are asked to send single frame pictures (or very short series of pictures) with a minimum of three repeated resolutions for QRM adjustment and P-7 tube converter burn-in. Everything from general comments and "hellos" to for-sale items or new products are discussed along with the latest "modifications" to converters, keyboards or computer interfaces. It is a great way to meet the SSTV Amateur Television crowd and further the state-of-art. Twenty-seven SSTV stations have qualified for a special NET certificate awarded to those who check-in and run video on any three Nets.



Tune up on 28 Mhz. and "give it a try!"

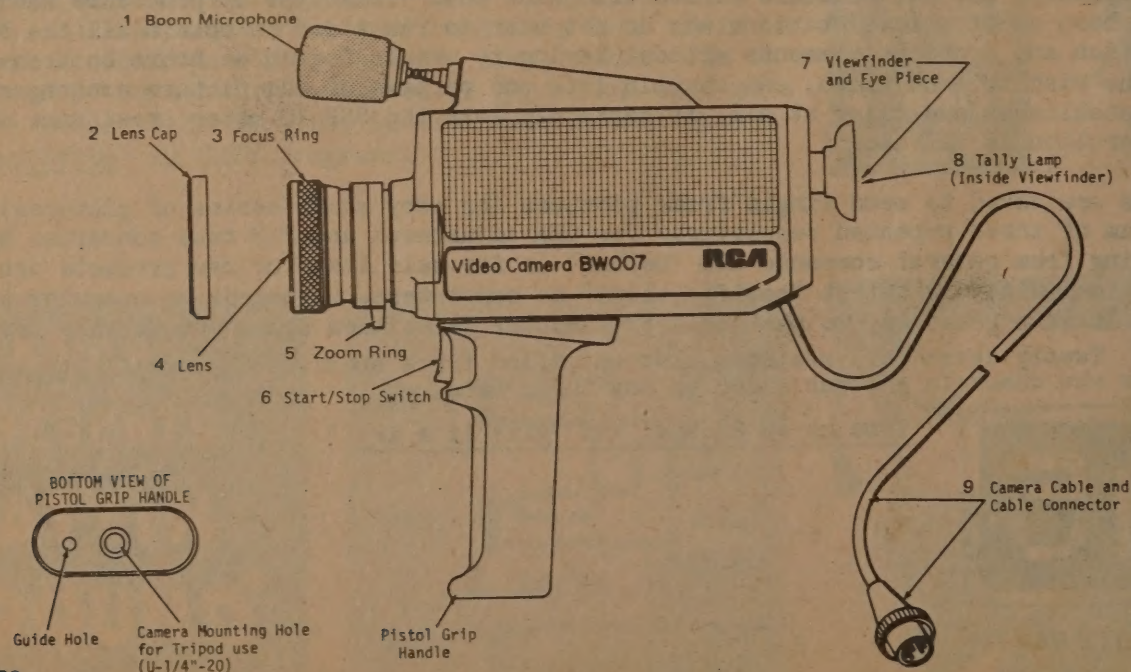
RCA-007 CAMERA

Mike Stone, WBØQCD

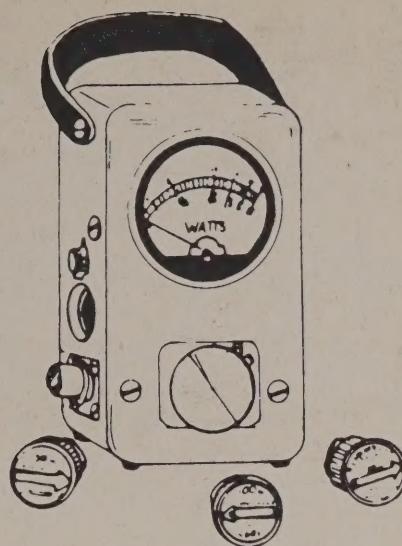
With the state-of-art in Magnetic Video Recording equipment ever changing in both cost and features, there are from time to time some real bargains if you happen to be lucky enough to find them available. One such "bargain" is the RCA-007 Black/White Camera.

Pictured below, this camera offers many unique features that would be very desirable in Amateur Fast Scan Television and Slow Scan Television. First, it is lightweight, weighing 3.2 lbs (1.45 kg.) with a handy "pistol-grip" handle for portability. The grip handle also doubles with a standard 1/4" X 20 threaded hole for tripod mounting. It has its own separate AC power supply which consumes approximately 7.5W at 120V +/-10% AC 60hz +/-0.5hz. The camera is designed for VTR use and has appropriate cables pre-wired with hookup to the power supply for microphone, video and start/stop triggering. The big feature with this unit is a quality 4:1 Manual Zoom lens featuring a "Macro" position setting for close up work. The manual says up to 4" but I have reproduced my QSL card small writing perfectly up to 1" closeup. Automatic light compensation is 5 to 10,000 ft. candles (50 lux) with f 1.8 14-56 mm lens. The "Macro" position will fulfill all the close-up artwork desired in SSTV as well as some unique zoom-in shots every frame of the gear in the shack. A house 1 block away can be brought up in magnification to the point where you are looking at one window. The "boom-mike" is most likely worthless in SSTV work if no VTR is used, but in fast-scan television it might be used for the audio reproduction system in the FSTV transmitter. The see-thru "viewfinder" is great for setting up shots as it lets you see exactly what the vidicon is looking at. A "tally light" comes on in the viewfinder when the operator engages the trigger switch on the pistol-grip handle which is used for controlling the pause switch on a VTR unit. The camera video output connector is a standard RCA phono jack as is the audio mike line.

Many of the Video magazines and retail outlets sold this camera for around \$429.50 when color cameras and color VTR's were not as popular as today. I bought my camera from my friend Donny at Communications Center in Lincoln, Nebraska as he bought 70 of these with the ATV'er in mind. Selling price is an unbelievable \$179.95! Guaranteed from RCA 90 days. If you'd like alive demonstration, catch me on 28.680 Mhz. 73's Mike
(Communications Center 1-800-228-4097)



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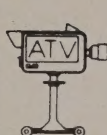
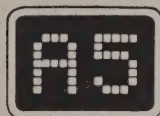


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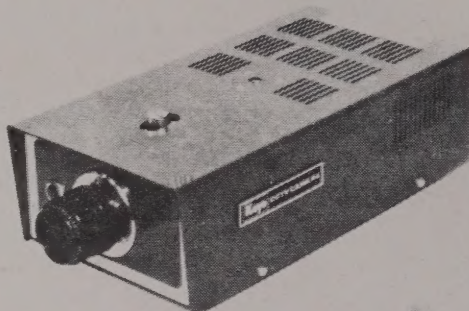
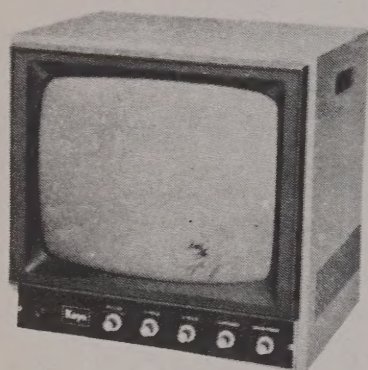
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